PACKAGE engineering

Why not speed up your drum filling?

Featuring a specially built empty drum feed mechanism and a battery of four lines in two pairs, this switch to semi-automatic 55-gal. drum fillers provides a 50 per cent boost in daily production capacity. (See Page 31)

"Mating" flexible packaging and food products

Using the right tests, having enough actual packages to use, subjecting them to realistic handling—all contribute to selectivity in getting the correct material for a particular product. (See Page 34)

Some fine points of packaging management

A noted director of research and development tells just how he goes about his job, revealing effective techniques of managing packaging research and coordinating it with the rest of the company. (See Page 52)

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JULY 1959

Volume 4 • Number 7

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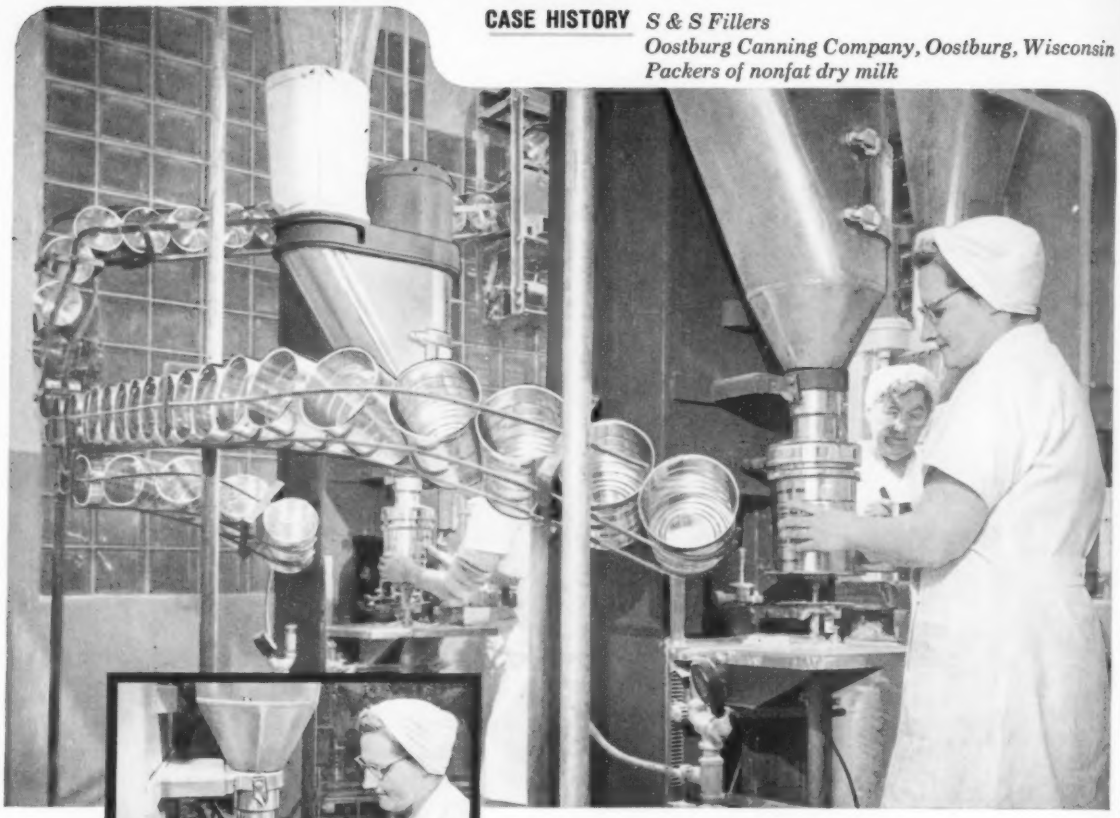
CASE HISTORY *S & S Fillers*
Oostburg Canning Company, Oostburg, Wisconsin
Packers of nonfat dry milk



Number 10 cans are fed to the EG Filler via conveyor where they are positioned by the operator. The Auger-Vac then removes the proper amount of air permitting the filler to load 4½ pounds of powdered milk into the can at a rate up to 25 cans per minute without "dusting."

Powdered milk filling loss less than .00058%

"Of the more than 200,000 pounds of powdered milk we handle each day, we lose only 110 to 115 pounds—or .00058%—due to dusting at the loading hoppers and filling stations. This amount would be much larger if we did not have Stokes & Smith Fillers with Auger-Vac attachment," reports Mr. Ellsworth Van Driest, secretary-treasurer of the Oostburg Canning Company.

"Before buying our fillers, we inspected other powdered milk operations to determine which machines were most efficient. We found that Stokes & Smith equipment led the field by a wide margin. In addition to three S & S G1 Fillers, we also purchased two S & S EG Fillers to permit quick easy conversion from packaging in 4½ pound, No. 10 cans to bagging cartons when the latter package is required.

"We have found our fillers to be dependable, rugged, well-designed and versatile. After two years of constant use, they are never down longer than one hour at a time. This ease of servicing plus versatility helps us maintain our 'full status' with U. S. Dept. of Agriculture packaging requirements."

Putting Ideas to Work

fmc
FOOD MACHINERY AND CHEMICAL CORPORATION

FOOD MACHINERY AND CHEMICAL CORPORATION
FMC Packaging Machinery Division
Stokes & Smith Plant
4994 SUMMERDALE AVENUE, PHILADELPHIA 24, PA.

For more information circle No. 201 on Reader Service Card, Page 66

Aluminum Foil Packaging–Case Liners and Multiwall Bags

Report No. 22 of a Series by Reynolds Metals Co.

The technology of packaging, particularly in the use of flexible packaging materials, is generally associated with consumer goods. Most of the reports of this Series have dealt with products sold through regular retail outlets.

Bulk Packaging Important

Equally important, however, and often involving even more critical problems, is the bulk packaging of products and materials destined for other than retail channels. In this field, too, progress has centered around the use of aluminum foil. In the form of case liners and multiwall bags, aluminum foil provides maximum protection against moisture loss or gain, oxidation, insect infestation, grease absorption and flavor loss for extended periods of time. This has made possible the successful bulk packaging of such foods as nuts, shredded coconuts, dried fruit and dehydrated milk and eggs.

Aluminum Foil Case Liners

Fabricated case liners of heat-sealable aluminum foil laminations are simply inserted in fiberboard or corrugated cases. The resulting containers are low in cost. They save on shipping and on cost of handling. They save on space, whether empty or filled. They can readily be adapted to automatic or production line operation. They can attain high strength, through many combinations of paper, fabrics and plastics. And they can take many shapes or sizes, with changes in size effected easily and inexpensively.

Foil Multiwall Bags

Aluminum foil multiwall bags have the same advantages as case liners but in a non-rigid container. Multiwall bags are especially suited to powdered or granulated material such as chemicals used in many industries. Among these are resins used in molding and extruding and in the manufacture of lacquers and adhesives. These must be kept absolutely free of moisture for best performance, and aluminum foil multiwall bags assure the required protection. Activated alumina is another material which must be safeguarded against contamination and moisture. Like the restaurant owner who advertises: "I eat my own cooking," the Reynolds Metals Company uses aluminum foil multiwall bags to bulk-package its own activated alumina.

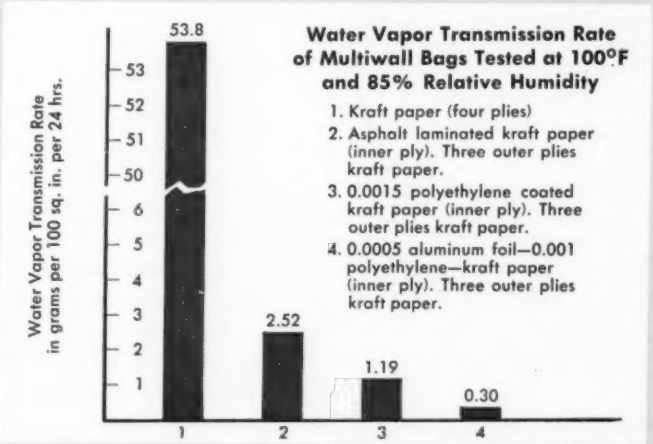
Other products which today are bulk-packaged in aluminum foil include many types of delicate instruments and sensitive equipment. Whether in the form of case liners or multiwall bags, the aluminum foil protects products like these against rust and corrosion.

Explanation of Chart

The chart presented herewith shows the Water Vapor Transmission Rate of different multiwall bags, ranging from multiple plies of kraft paper only, to a combination of aluminum foil, polyethylene and kraft paper. Exact compositions of the multiwall are described in the chart. These bags all contained anhydrous calcium chloride as the dessicant and were tested at 100°F. and 85% relative humidity. All had glue-sealed lap-seam and sewn ends which were wax dipped. It will be noted that materials No. 3 and No. 4 are similar except for the addition of aluminum foil—which addition reduced the Water Vapor Transmission Rate by almost 75%, bringing it down as low as 0.30. Heat-sealed aluminum foil case liners are available with Water Vapor Transmission Rate below 0.05 gms. Multiwall bags are now available with a heat-sealed inner ply. The inner ply consists of .00035 aluminum foil coated with 2 mils of polyethylene. This provides for complete sealing of the bottom, top and seam.

The Reynolds Metals Company does not produce case liners or multiwall bags, but as a supplier of foil, the company has long been active in the research and development of these bulk packaging applications.

For consumer products, Reynolds offers a complete service—finished packaging of all types from color-gravure-printed folding cartons and overwraps to boilable pouches and heat-and-serve containers. For information, call your nearest Reynolds representative or write to **Reynolds Metals Company,** Richmond 18, Va.



Watch Reynolds TV show "Walt Disney Presents" Friday nights on the ABC-TV Network.

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JULY 1959 • VOLUME 4 • NUMBER 7

PACKAGE engineering

AN ANGUS J. RAY PUBLICATION

For your calendar

July 27-31. AMA orientation seminar, "Current applications in the field of packaging," Colgate University, Hamilton, N. Y. Contact: John L. Wood, American Management Association, 1515 Broadway, New York 36, N. Y. *Telephone: JUdson 6-8100.*

August 17-21. AMA workshop seminar, "Costs and controls," Colgate University, Hamilton, N. Y. Contact: John L. Wood, American Management Association, 1515 Broadway, New York 36, N. Y. *Telephone: JUdson 6-8100.*

September 21-23. AMA orientation seminar, "How to set up and manage an economical fill control program," The Hotel Astor, New York, N. Y. Contact: John L. Wood, American Management Association, 1515 Broadway, New York 36, N. Y. *Telephone: JUdson 6-8100.*

September 28-30. AMA workshop seminar, "Packaging line layout," The Hotel Astor, New York, N. Y. Contact: John L. Wood, American Management Association, 1515 Broadway, New York 36, N. Y. *Telephone: JUdson 6-8100.*

November 2-4. AMA packaging seminar, "Manufacturing's part in the overall packaging program," The Hotel Astor, New York, N. Y. Contact: John L. Wood, American Management Association, 1515 Broadway, New York 36, N. Y. *Telephone: JUdson 6-8100.*

November 2-4. AMA packaging seminar, "Printing on packaging," The Hotel Astor, New York, N.Y. Contact: John L. Wood, American Management Association, 1515 Broadway, New York 36, N.Y. *Telephone: JUdson 6-8100.*

November 9-11. AMA packaging seminar, "Fundamentals of packaging specifications," The Hotel Astor, New York, N.Y. Contact: John L. Wood, American Management Association, 1515 Broadway, New York 36, N.Y. *Telephone: JUdson 6-8100.*

November 16-18. 21st annual national packaging forum of Packaging Institute, Hotel Statler, New York, N. Y. Contact: Charles A. Feld, executive director, Packaging Institute, 342 Madison Avenue, New York 17, N. Y. *Telephone: MUrray Hill 7-8875.*

November 17-20. Packaging Machinery Manufacturers Institute Show, New York Coliseum, New York. Contact: Hanson & Shea, Inc., One Gateway Center, Pittsburgh 22, Pa. *Telephone: ATlantic 1-8552.*

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Stressing a specially-built empty drum feed mechanism and the combining of four lines in two pairs—giving a 50 per cent boost in productivity.

34 Food in flexible packaging, by John J. Birdsall, assistant director, laboratory projects, Wisconsin Alumni Research Foundation

Having enough actual packages and giving them realistic treatment goes hand in hand with test methods and selectivity processes in getting the best material.

44 New approaches to packaging line efficiency, by Charles H. Kretschmer, Jr., president, Kretschmer Wheat Germ Corporation

Combining methods and techniques of liquid and granular product filling and building special equipment to coordinate with units of standard machinery.

52 Four steps to effective packaging research, by Charles W. Kaufman, director, research and development division, National Dairy Products Corporation

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Dovetailing package and product design and development, and balancing conflicting views of company departments to get an optimum package.

64 Troubleshooting automatic controls in three minutes! by Fred J. Bush, engineering manager, Chesebrough-Pond's, Inc.

Wiring control devices, using plugs that twist and lock, permit quick checking of troublesome circuits in tracking down sources of packaging machine failure.

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Our December, 1959 issue will carry a cumulative editorial index for the year listing our feature articles by subject, author, and other headings.

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A note from the Publisher

American packaging machinery

One aspect of the AMA National Packaging Exposition this year that was different from former years was the foreign-built packaging machinery exhibited. Several European manufacturers exhibited and, in addition, there was other equipment exhibited that was foreign-made, though not specifically billed as such. It is probable that more European packaging machinery manufacturers will invade the American market.

While the price of certain foreign equipment may seem attractive, there is much more involved than simply buying the piece of machinery that costs less.

Packaging is an American conception; the American manufacturer has grown up with packaging, and knows your market. While I would be the last one to say that every piece of American equipment is superior to a foreign-made counterpart, I do think that all things considered, the American-built machinery is your best buy.

Consider service and parts. The American manufacturer has a complete inventory of parts and an engineering staff readily available. Can you afford to do business as remotely as you would have to do if you had a problem that had to be straightened out with a manufacturer abroad?

I've heard it said that European equipment requires less service. This is not so. When the American buyer uses as much care in setting up American-built machinery as the European buyer does when he buys and sets up American machinery, he has no trouble. There is nothing that can touch it for trouble-free, week-after-week production at speeds usually above its rated capacity.

An efficient production line is one in which machinery and packages or packaging material have been intelligently combined. The familiarity the American machinery manufacturer has with your package suppliers is a tremendous plus value.

Another factor to consider is the modifications you may want to make at a later date. For example, you may begin by using one size package and then find that changing market conditions dictate a different size package. It's comparatively simple to modify American equipment, but getting a piece of foreign-built equipment modified can present quite a problem.

One might be tempted to look around for a piece of standard equipment abroad and get the more complicated and faster machinery here. However, for American companies to be able to continue developing the kind of machinery that will enable you to continue operating at a profit, they must have the simple jobs as well as the tough ones.

The advantage of buying specialized American machinery is obvious because foreign machinery is just not far enough advanced to do the job.

The advantages of buying the simpler pieces in America are fourfold: availability, service, durability, and modification possibilities. The facts are obvious—you will be ahead with American-built machinery.

Angus J. Ray

Publisher

PACKAGE engineering®

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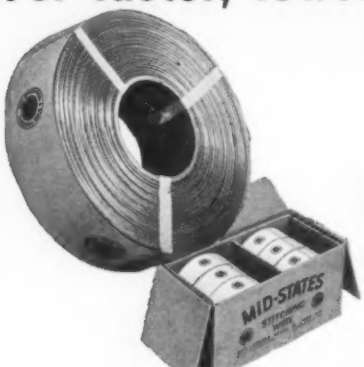

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Letters to PACKAGE engineering

Re: User-supplier teamwork

Gentlemen:

Our compliments to you on your editorial in June PACKAGE ENGINEERING on user-supplier teamwork for machinery development. From the standpoint of many manufacturers, there is a growing need for more versatile, medium to high-speed equipment with quick changeover time.

Our production method engineers have worked very closely with certain suppliers in the development of special or modified packaging machines to answer this need, and both of us have learned that "the proof of the pudding" comes in actual production runs in our plant. Set-up and short runs in the supplier's plant are always helpful in clearing out the "bugs," but the limited operation of such tests cannot be construed as adequate trial for newly designed machinery.

I'm sure there are a host of manufacturers who will welcome the news that the package machinery industry is taking increased interest in this field.

J. E. Zink
Purchasing Division
Eli Lilly and Company
Indianapolis, Indiana

Your comments stress two significant factors: (1) Growing interest in equipment running at speeds lower than today's highs, and (2) machine testing under realistic, sustained conditions. We shall watch with interest how machinery builders bridge the gap between low (e.g., manual or semiautomatic units) and high speed. And once leading users "team up" with machine builders, we should see progress in machine performance. (*End*)

the NEW 32 oz. Plastic Jar

Here's the latest star performer in our line-up of plastic jars and vials—the big, beautiful 32 oz. jar. Available for immediate shipment in two materials: linear polyethylene with overflow capacity of 32.3 fluid ounces—weight 211 pounds per thousand; or polystyrene (clear) with overflow capacity of 33.8 fluid ounces—weight 212 pounds per thousand. Either jar takes a standard 120 mm closure.

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The PULSE / of packaging

Trends to watch:

Packaging toothpaste in plastic "squeeze" tubes is now possible, **American Can Co.** says, pointing out that it has developed a coating for tube inner walls to prevent loss by permeation of flavor and essential oils. We hear that a number of toothpaste manufacturers are laboratory-testing the new container.

Months of test marketing have convinced **H. J. Heinz Co.** that consumer acceptance justified switching to screw-on caps from pry-off closures for most of its strained and junior baby foods. Heinz calls its new cap a "convenience packaging milestone," noting that it permits storing unused baby food in the original container . . . Reports indicate there is rapidly growing use of extensible ("stretchable") kraft paper for multiwall bags by feed manufacturers. Licensees of the process also say these bags are finding use in the shipping of cement, sugar, chemicals, salt, flour and fertilizers.

Aluminum Co. of America predicts growing use of aluminum aerosol cans for "push-button" foods, adds that these cans are made by impact extrusion, thus permitting seamless construction . . . A West coast manufacturer is now packaging a new household laundry detergent in water-soluble plastic pouches, each holding a premeasured quantity for one machine wash.

General Motors Corp. announced having its own two-day "packaging round-up" with 30 different GM divisions displaying new and cost-saving packages and packaging equipment. One high spot of this conference: A "garbage can" container for the Thor missile "brain." . . . **General Electric Co.** held its two-day heavy industry packaging seminar with experts from 23 GE departments attending. GE says its box, pack and ship expenses totaled nearly $47,000,000 last year, ranking third in purchased material. GE's goal: An annual expense reduction of at least 7 per cent —to keep this expenditure in check.

Packagers become politically articulate: **American Can Co.** urges business to "market" its political viewpoint as forcefully as its products and services. Urging its management and employees to speak out on political questions, Canco has named a team of 153 management people across the country to act as official spokesmen for Canco to 153 representatives and 52 senators representing states and congressional districts in which Canco has facilities.

Packaging across the seas:

West Virginia Pulp and Paper Co. is introducing "Sterling Waxbar," a new packaging paper with a gloss, washproof coating and a wax barrier, to its foreign markets, says that English markets and packagers in nations of the European Common Market, particularly West Germany, have shown interest.

Soviet Russia's highly touted mechanization has a long way to go according to those familiar with its "high-speed" beer bottling operations. They tell us Russian breweries have automatic lines with output capacities of 3,000 and 6,000 bottles of beer/hr. (By comparison, one American brewer reports delivering 30,000 12-oz. or 12,000 qt. bottles/hr. at one of its new breweries.)

Reports by **Rheem Manufacturing Co.** about selling certain facilities to **Aero Jet-General Corp.** brought out that Rheem has been expanding its international operations in 15 countries. When its newest plants in Chile and New Zealand start production this summer, it will bring the number of its facilities abroad to 21 plants.

Clupak, Inc. has named Dieter O. Muller-Clemm of Ravensburg, Germany to represent it in continental Europe . . . **Inland Steel Container Co.** and the **Van Leer** group of container manufacturing companies of the Netherlands plan to combine research-development efforts on an international basis, are setting up joint research facilities in England and in the Netherlands. The Van Leer group operates 32 container plants throughout the world, but none in the U. S.

Groups in the news:

Aircraft Industries Association has named Eugene McDermott, General Electric Co., chairman of its preservation and packaging committee . . . **Society of Packaging and Handling Engineers** and **American Material Handling Society** have decided not to merge. Their decision terminates several years of exploratory discussion and serious consideration of merging.

More expansion for packaging:

National Starch and Chemical Corp. now has a pilot paper coater at its Plainfield, N. J. research laboratory, says the coater will do all six major types of coating and sizing processes as done on latest mill equipment . . . **Continental Can Co., Inc.** plans to acquire **Fort Wayne Corrugated Paper Co.** in exchange for 496,000 shares of Continental Can common stock and by Continental's assuming Fort Wayne's liabilities. We understand Continental has reached an understanding with the U. S. Department of Justice whereby it will dispose of at least two of Fort Wayne's four box plants, is now negotiating the sale of three of these plants.

The Dow Chemical Co. is spending $12,000,000 in new construction for its Louisiana division, expects to have a polyethylene plant on stream in 18 months and plans facilities to produce vinylidene chloride and Chlorothene. Also, Dow is adding a polyethylene production plant at Freeport, Tex. . . . **The Du Pont Co.** is building a second plant to manufacture its "Mylar" polyester film at Florence, S. C.

Container Corp. of America recently opened its new bleached sulphate paperboard mill at Brewton, Ala. . . . **Eastman Chemical Products, Inc.** is increasing its polyethylene production capacity at **Texas Eastman Co.**, Longview, Tex., from 85,000,000 to 100,000,000 lb. annually . . . **Sherman Paper Products Corp.** is licensing **Sorg Paper Co.** to make its latex-coated cohesive papers . . . **Stein, Hall & Co., Inc.** is adding a paper gumming, coating and laminating machine to its research and development facilities at Long Island City.

Chicago Molded Products Corp. is acquiring **Capac Plastics, Inc.**, Minneapolis . . . **The Coates Board & Carton Co., Inc.** has added 100,000 sq. ft. of plant floor space to its Garfield, N. J. plant . . . **Cutter Laboratories** has purchased **Olympic Plastics Co., Inc.**, plastic container manufacturer . . . **Inland Container Corp.** and **The Mead Corp.** have established **Forest Kraft Co.** to finance expansion of the **Rome Kraft Co.** at Rome, Ga. Inland and Mead will divide equally the output of the Forest and Rome companies . . . **Pamco Printed Tape and Label Co.** has a new 60,000-sq.-ft. plant in Chicago.

The Atlantic Refining Co. now has a new paraffin wax plant at Philadelphia, expects to produce over 216,000,000 lb. annually, marketing much of this product to manufacturers of wax-coated food

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By using MARLEX *rigid* polyethylene, PLAX obtains an ultra-lightweight bottle, with extra-strong, thin walls. This new bottle is unbreakable and resistant to corrosion and permeation by most chemicals. It can be frozen or sterilized. It is so inexpensive that it is used as a throwaway container!

The new PLAX gallon bottle uses 37% less warehouse, truck and carload space . . . weighs only 3 oz.—1/15th the weight of comparable glass bottles! Thinner corrugated with less tare weight can be used with these MARLEX "gallons", because they are lighter and do not risk breaking.

This new PLAX "gallon" is suitable for a wide variety of liquids, including: **shampoo, vanilla extract, pool chlorifiers, defoliant, paint primer solvent, arsenic acid, hydrofluoric acid, sulfuric acid, muriatic acid, hydrochloric acid, disinfectants, cleaning agents, and windshield washer fluid.** The U. S. Public Health Service has adopted it for shipment of pharmaceuticals.

If you are packaging with molded containers, transparent film or blown bottles, you should know more about MARLEX. Write for new technical brochure today!

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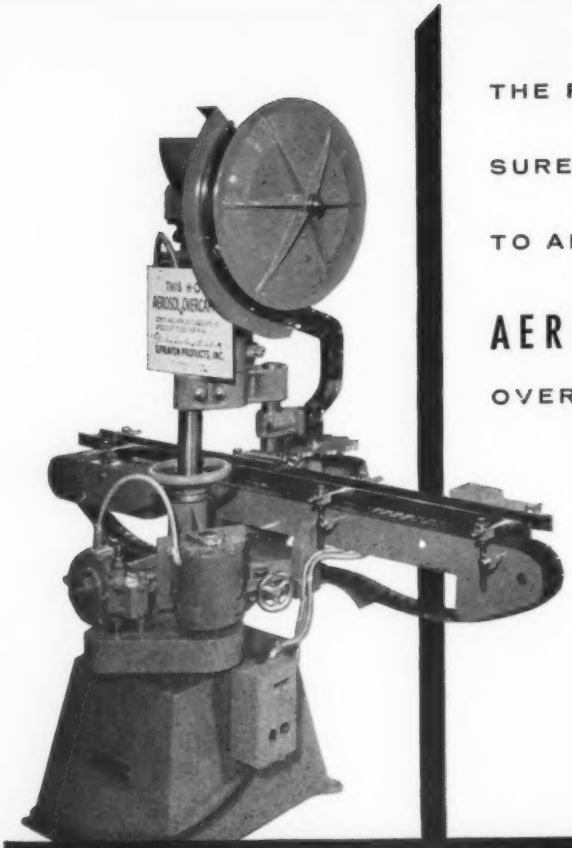

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If you are using aerosol containers, be sure to get all the facts about the Consolidated H-O-F Capper for applying the overcaps before you buy.

Write for complete information

CONSOLIDATED PACKAGING MACHINERY CORP.
1400 West Ave., Buffalo 13, N. Y.

packages . . . **Crown Zellerbach Corp.'s Western Waxide Div.** now has a new polyethylene film extrusion plant in Orange, Tex. It expects to produce more than 16,000,000 lb. of free film annually.

Fibreboard Paper Products Corp. is building a new kraft pulp and paperboard mill at San Joaquin, Calif.

Packaging dollars and cents:

Minnesota Mining and Manufacturing Co. reports 1959 first quarter sales of $102,361,998, as compared to $85,207,362 for the same period in 1958. 3M attributes improved results to "a strong showing" by new products and "continued progress" in controlling costs . . .

Net sales and operating revenues in the first quarter of 1959 for **Olin Mathieson Chemical Corp.** were $159,909,000, compared with $127,625,000 for the first three months of 1958. Net profits totaled $6,395,000 for the same period, compared with $4,473,000 in the first quarter of 1958.

Continental Can Co. showed a decrease in net sales and operating revenues for the first quarter of 1959—$236,941,000 for 1959 as compared to 1958 first quarter sales of $240,803,000. The first three months of 1959 showed a net income of $5,928,000 as compared to $7,092,000 for the same 1958 period. Forward buying because of price increases for metal cans effective March 10, 1958, inflated 1958 first quarter sales, Continental says.

American Can Co., reports record sales for the first quarter of 1959, $227,084,796, as compared with $220,137,507 for 1958's first quarter. Earnings for the same period also rose, from $7,056,773 for 1958 to $7,838,649.

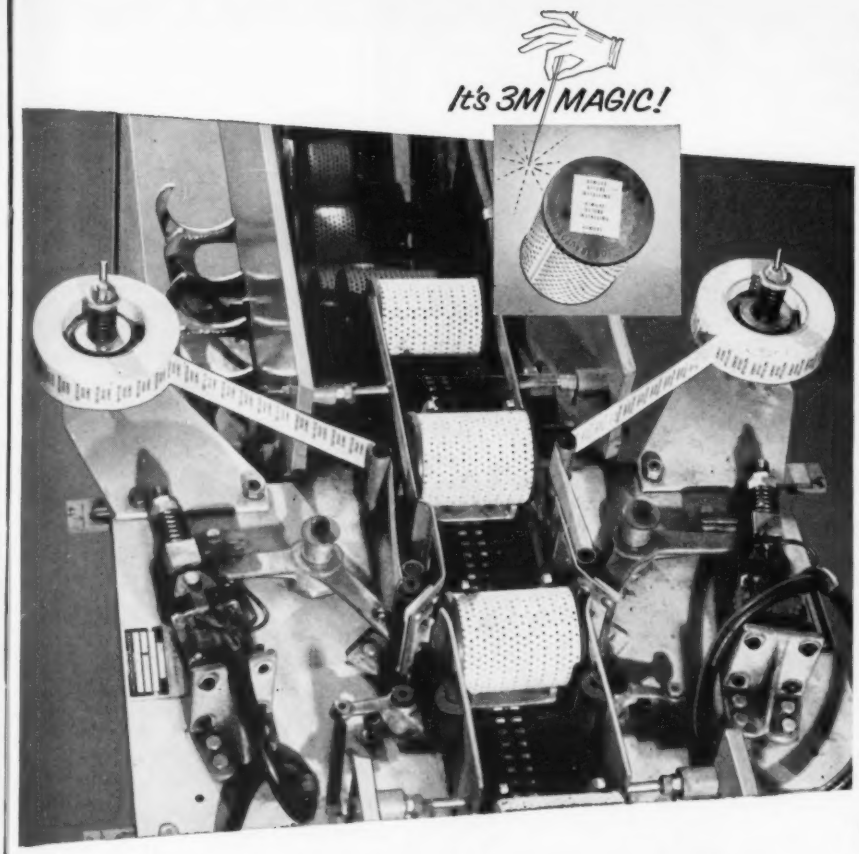
For the first quarter of 1959, **Knox Glass, Inc.** reports net sales of $9,270,780, as compared with $8,319,209 for the same period last year. Net income for the first quarter of 1959 amounted to $267,514, as compared with $191,965 for the same quarter of 1958.

Celanese Corp. of America reports net sales for 1959's first three months amounting to $58,890,158, compared with $48,964,912 for 1958's first quarter. Net income was $4,895,879 for the same period as compared with $2,509,710 for 1958.

Stone Container Corp. reports net sales totaling $9,408,049 for the first quarter of 1959, as compared with $8,156,858 for 1958's corresponding period. First quarter net income was $459,963, as compared to $347,909 for the first quarter of 1958. Stone Container attributes much of this increase to better business conditions in areas it serves.

What people are doing:

Dr. Bernard Oser has been named consultant on coatings for aluminum



SCOTCH BRAND
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SCOTCH BRAND

New TAPEnology gives dust protection at 20 units a minute!

The oil filter cartridges shown above were packed in 4-unit cartons, safe from dust and other contamination *until the carton was opened.* Then the center cores began to accumulate dust and debris. Needed was a covering that would (1) go on easily (2) stay in place in storage (3) remove easily.

3M Customer Engineering Service, working with the manufacturer's engineers, devised the high-speed fully automatic tape applicator shown: as the filter cartridges come down an endless chain conveyor, two "SCOTCH" BRAND S-601 flat-surface applicators simultaneously apply short strips of printed "SCOTCH" BRAND Colored Paper Tape No. 256 over the core openings. Cores are safely, securely sealed at the rate of 1,200 units an hour for a cost of approximately .002¢ per unit.

What's your packaging problem? Chances are, "3M-MATIC" Taping and dispensing methods can help you solve it. Ask your nearest "SCOTCH" BRAND Tape Distributor for complete information, or write: 3M Co., St. Paul 6, Minn., Dept. IAK-79.

When tape costs so little, why take less than "SCOTCH" Brand?

"SCOTCH" is a registered trademark for the pressure-sensitive adhesive tapes of 3M Co., St. Paul 6, Minn. Export: 99 Park Ave., New York 16. Canada: London, Ontario.

MINNESOTA MINING AND MANUFACTURING COMPANY
. . . WHERE RESEARCH IS THE KEY TO TOMORROW

3M COMPANY

A cleaner, faster operation resulted as International Equipment Co., Boston, switched from excelsior (left) to Cel-Fibe wadding (right) to wrap motors, parts, test tubes, and dynamically balanced instruments in its line of precision centrifuges for laboratory uses.

CEL-FIBE® protective packaging doubles output, increases safety

"Cel-Fibe cellulose wadding is the best packaging material we have ever used," says C. Clifford Hodge, production coordinator for International Equipment, leading supplier of laboratory centrifuges, citing these improvements:

Savings in time, labor. An operator packs double the amount—Cel-Fibe wrapping takes only half as long.

Savings in materials. With Cel-Fibe, one carton holds as much as was formerly packed in two cartons or a wooden case. Cel-Fibe ends the need for separators to partition tubes, fragile parts, and glassware.

Savings on storage. Wadding, paper, and other packaging materials are kept with space to spare in a room that had previously been set aside for storing a ton of excelsior.

Savings in shipping weight. Cel-Fibe permits use of fewer, lighter cartons.

Savings in maintenance. Apart from easier handling, non-shredding and non-powdering Cel-Fibe leaves no dust in the air or dirt on the floor, reduces clean-up time . . . also makes it easier, faster, and less messy for customers to unwrap orders.

Savings on returns. Low-sulfur and neutral-pH Cel-Fibe guards metals from corroding and surfaces from marring, avoids return of centrifuges bent or unbalanced in transit.

Your packaging problems can probably be lessened by learning how "success is certain with Cel-Fibe" in meeting military specifications and civilian requirements for cushioning and surface protection. Cel-Fibe is always available, when and as you need it. For more information—*write, wire, or phone:*

CEL-FIBE
Division of Personal Products Corp.
Milltown, N. J. • Milltown 8-0700

ONE OF THE Johnson-Johnson COMPANIES

foil by Aluminum Co. of America. Alcoa also named **Clifford Sands** industry manager for rigid containers and **Phillip C. Althen** technical manager . . . **Willard L. Newman** is now manager-package development for General Electric Co.'s manufacturing laboratory . . . Arthur Colton Co. has named **Lewis H. Kinsley** chief engineer—packaging machinery.

Francis J. Sloan, formerly manager of packaging research with Package Machinery Co., is now a packaging consultant . . . **E. H. Jones, Jr.** is now general sales manager of St. Regis Paper Co.'s kraft division and continues as administrative assistant to the vice president. St. Regis' Rhinelander Div. has named **Dr. Richard C. Crain** technical director, **Dr. Francis Ratliff** research director, and **John Gaffney** manager of technical service and product development department.

New sales manager for Horix Manufacturing Co. is **Robert G. Wirthlin** . . . Morningstar-Paisley, Inc. has elected **Murray Stempel** president . . . **Kenneth N. Bacon** is now advertising and promotion manager of Clupak, Inc. . . . New corporate officers of Triangle Package Machinery Co. are: **L. R. Muskat,** chairman of board; **Peter Muskat,** vice-chairman of board; **Robert L. Muskat,** president.

Fibreboard Paper Products Corp. has named **Eugene V. Gear** director of creative design center, and **James J. Bauer** general manager of Precision Electrotype Co., a Fibreboard subsidiary . . . **William Liesenfeld** has been promoted to manager of technical service for Milprint Overseas Corp. . . . Packaging Corp. of America has named **Hyon Ho Shin** director of laboratory and quality control, and **John A. (Jack) Walls** to head its new package design services.

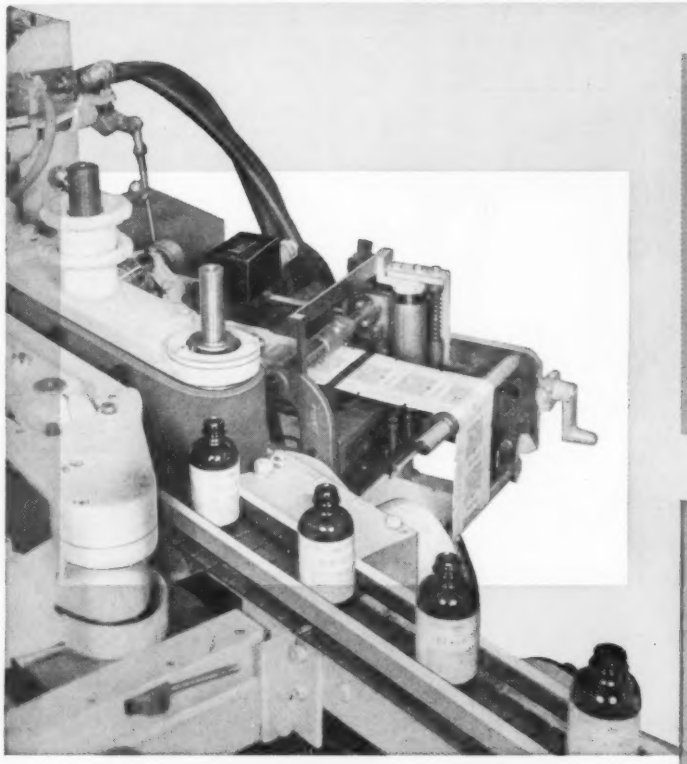
Riegel Paper Corp. has elected **Frederick S. Leinbach** president, succeeding **John L. Riegel,** who has been chairman of board and president, and continues as chairman . . . **N. H. Collisson** is now head of the metals division; **M. L. Herzog,** general manager of operations in metals division; **Richard M. Furlaud,** a corporate vice president; **Richard Bryce,** treasurer; **O. R. Gibbons,** product manager, cartons, for packaging division; and **Carl Campbell,** central district sales manager—all of Olin Mathieson Chemical Corp.

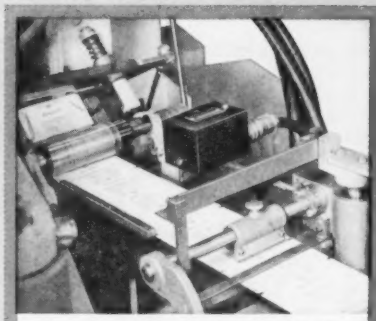
Armstrong Cork Co. has promoted **J. Franklin Everett** to manager of closure technical service of its Research and Develoment Center. Armstrong also named three new district managers—**P. W. Triplett,** Chicago; **John H. McCrea,** Detroit; and **H. Glenn Eshelman,** Cleveland.

Dr. Edgar E. Wrege is now operations manager of the special products department of American Viscose Corp.'s

New roll feed "no glue" labeling

Automatic verification, coding, protection and control





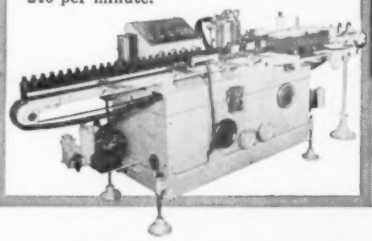
Shown here is the imprinting and coding head and electric eye controlled cut-off.

The Label-DRI Challenger complete with electric eye-controlled roll label feed. Speeds up to 120 per minute.

Also available:

The Semi-Automatic Pony Label-DRI. Speeds up to 60 per minute.

The Label-DRI Champion. Speeds up to 240 per minute.



Three New Jersey Label-DRI models now available

You get fast, fool-proof "no glue" labeling with these new roll feed Jersey labelers.

1 **Automatic label verification**—Once the first label has been checked, you know all other labels in the same continuous web must be the same.

2 **Automatic label coding** – Each label gets a clear imprint just before being applied to the container.

3 **"No-glue" labeling** – Labels in roll form are printed on thermoplastic label stock. You eliminate adhesive coating and are sure of more attractive label application.

4 **"Greater labeling efficiency"**– Eliminates mechanical separation of labels. No hopper to be set or reset to take care of label-cutting variations. No "doubling" due to "cling" caused by static electricity – ink offset – or dull cutting.

Check the Jersey Label-DRI that's best for you. Ask for details and a demonstration.

MAKERS OF THE PONY LABELRITE · NJM · NEW JERSEY MACHINE CORP

NEW JERSEY MACHINE CORPORATION

AUTOMATIC LABELING • CARTONING • PAPER BOX MACHINERY

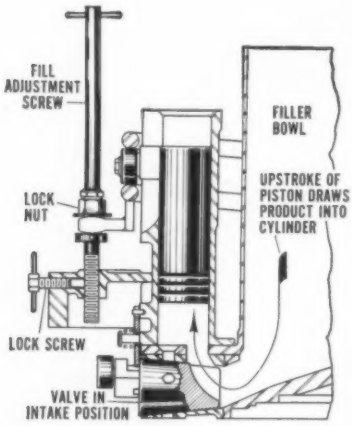
FACTORY SALES AND SERVICE BRANCHES | 1701 CAREW TOWER, CINCINNATI 2, OHIO | 325 W. HURON ST., CHICAGO 10, ILL. | 2500 W. 6th ST., LOS ANGELES 57, CALIF

MAIN OFFICE & PLANT • 16th ST & WILLOW AVENUE, HOBOKEN, N J

For more information circle No. 211 on Reader Service Card, Page 66

HOW TO MAKE A FILLER PAY ITS OWN WAY

Take a walk with us around a Pfaudler rotary piston filler and you'll see why many of our customers make the machine pay for itself in a year or two of operation.



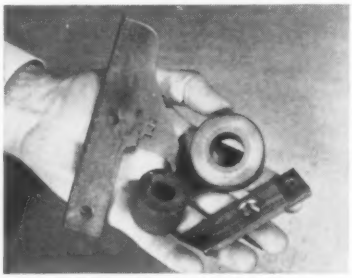
FAST FILL—NO SPILL. Look first at this piston design. It has just the right combination of smooth fit and small "cushion" to let you fill even very light products right through the range to heavy, viscous fluids. There's no surging. No splashing. No piston leakage. Accuracy is guaranteed on all sizes to $\pm \frac{1}{10}$ fluid oz.

You can accurately adjust the amount of fill without dismantling or even stopping the filler.

While you're looking, notice that none of the parts are within or over the bowl . . . this eliminates any possible contamination from lubricants.

HALF-HOUR CLEAN-UP. One man can clean a Pfaudler filler in *one-half* hour. He needs no tools or hoists. He removes only two parts . . . piston and valve . . . to make ready for complete cleaning. He makes no adjustments after cleaning. No gaskets to clean and refit.

Even on our largest filler there are only twelve grease fittings—all located in one convenient header. All gears are submerged in oil, so they require little maintenance.



LOW-COST REPAIRS. There are only four primary wearing parts on these fillers—piston and valve rollers, valve trip cams and valve-lock wear pads. All are small, inexpensive, easy to stock and replace.

Find out more about the savings you can make in labor and maintenance with rotary piston fillers, along with detailed specs on the many sizes, by writing our Pfaudler Division, Dept. PE-79, Rochester 3, N. Y., for Bulletin No. 911.

75 YEARS CREATING FOR TOMORROW

PFAUDLER PERMUTIT INC.
Rochester 3, N. Y.

Film Div. Also at Avisco, **Arthur W. Longworth, Jr.** has been transferred to Chicago for converter sales being replaced in New York converter sales by **Vernon D. Shaffer.**

American Can Co. has elected three new corporate vice presidents—**Albert O. Degling,** purchasing head; **E. T. Klassen,** industrial relations head; **C. F. Lausten,** head of research, development and machinery . . . Sherman Paper Products Corp. has named **Kermit Greene** vice president and assistant general manager and **Stanley A. Ferbank** comptroller, both of its Eastern division, and **Norton L. Sherman** director of purchasing, Newton operations.

Richard D. Dodge has been promoted to executive vice president of Dygert & Stone, Inc. . . . Ever Ready Label Corp. has named **Russell C. Hopcraft** plant superintendent and **Morris Shaw** general sales manager . . . **O. F. Richardson** is now vice president and director of sales of Coates Board & Carton Co., Inc.

Container Corp. of America has named two new sales managers, **Robert P. Barse,** dairy products, paraffinned and soft drink cartons, and **John L. Phillips,** dry cartons, at its Dallas-Fort Worth folding carton plant . . . **W. H. Dillon** is now sales manager of Bemis Bro. Bag Co.'s Minneapolis sales division.

Standard Packaging Corp. has elected **Richard W. Koch** to the board of directors, and **Harlan B. Johnston** as corporate director of purchases and traffic manager. At its Chemical Fine Paper and Board Div., **Garner A. Towne** has been named assistant division manager, **Stephen G. Stapley** plant manager, and **Richard W. Maley** assistant plant manager.

Assistant export manager for Celanese Corp. of America's foreign sales division is **Colin E. Campbell** . . . In the realignment of its sales department, W. R. Grace & Co.'s Polymer Chemicals Div. has named these district managers—**Ralph Biondi,** Northeast; **Warren Peterson,** Mid-Atlantic and South; **W. D. Singleton,** Midwest; **DeWitt Cheney,** West.

Two new vice presidents of Inland Container Corp. are **James O. Harris** and **C. Wayne Smith** . . . Federal Paper Board Co., Inc. has named **James A. Turner** manager, frozen food sales . . . **Earl F. Schimkola** is now sales manager for custom polyethylene bags, **Nason E. Allen,** sales manager and **Robert R. Gilbert** assistant sales manager of stock products division—all of The Dobeckmun Co.

Owens-Illinois Glass Co. has named **William R. Bofenkamp** general manager of its St. Paul corrugated box plant, paper products division, and **Frank Cannon** Eastern regional sales manager of its multiwall bag division. (*End*)

For more information circle No. 212 on Reader Service Card, Page 66
Circle No. 213 on Card, Page 6

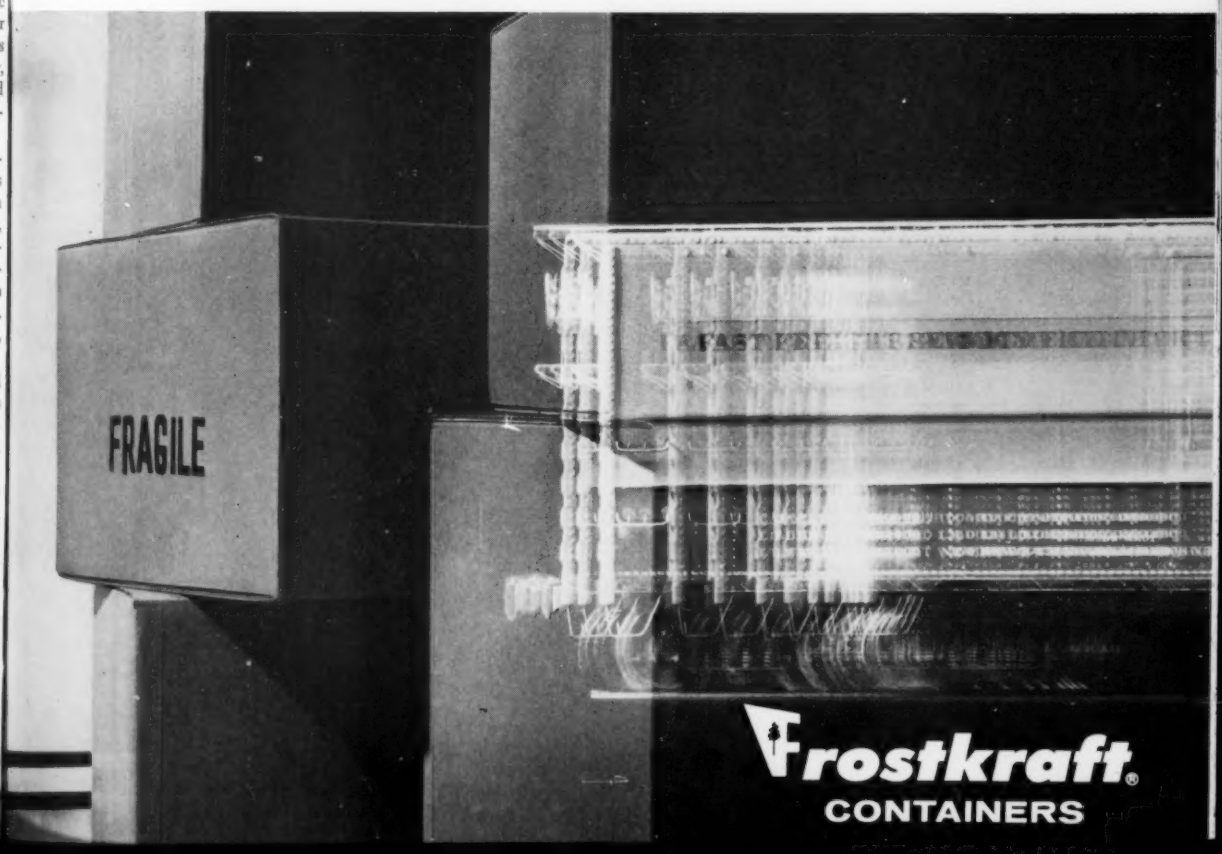
another Olin Mathieson packaging idea!

SKID-MASTER

A shipping container with a built-in grip!

Skid-Master containers are clean, tough natural kraft ...with an "invisible" non-slip finish built right into the board itself! There's no tacky coating, surface grit, or perforation. The surfaces are completely clean and smooth to the touch! With Skid-Master plus Olin-Mathieson design techniques, you get sure protection, without sacrificing strength, good looks, printability or sealability! Local service available from six plant locations. Contact Olin Mathieson today: Packaging Division, W. Monroe, **La.**

OLIN MATHIESON • PACKAGING DIVISION



A Machine Test on Bread Packaging . . . typical of hundreds conducted on actual production-line equipment at Du Pont's Film Department Mechanical Development Laboratory.

Tests like this help Du Pont develop cellophanes that assure you top production speeds and efficiency

Bread—60 loaves a minute. Cigarettes—up to 275 packs a minute. Twist wrap candies—1,000 a minute. For direct wraps, overwrapping, bag making and filling and a variety of other automatic and semiautomatic applications, cellophane assures you top speeds and efficiency.

The reason: cellophane's unique balance of properties that makes it the most versatile packaging material you can use. It is static-free . . . has a wide heat-sealing range . . . gives a clean operation. It is flexible yet has a rigidity that helps give top machine performance.

Tests like the one shown above assure that you get the cellophane tailored to meet *your* needs . . . when you specify Du Pont cellophane by code designation.

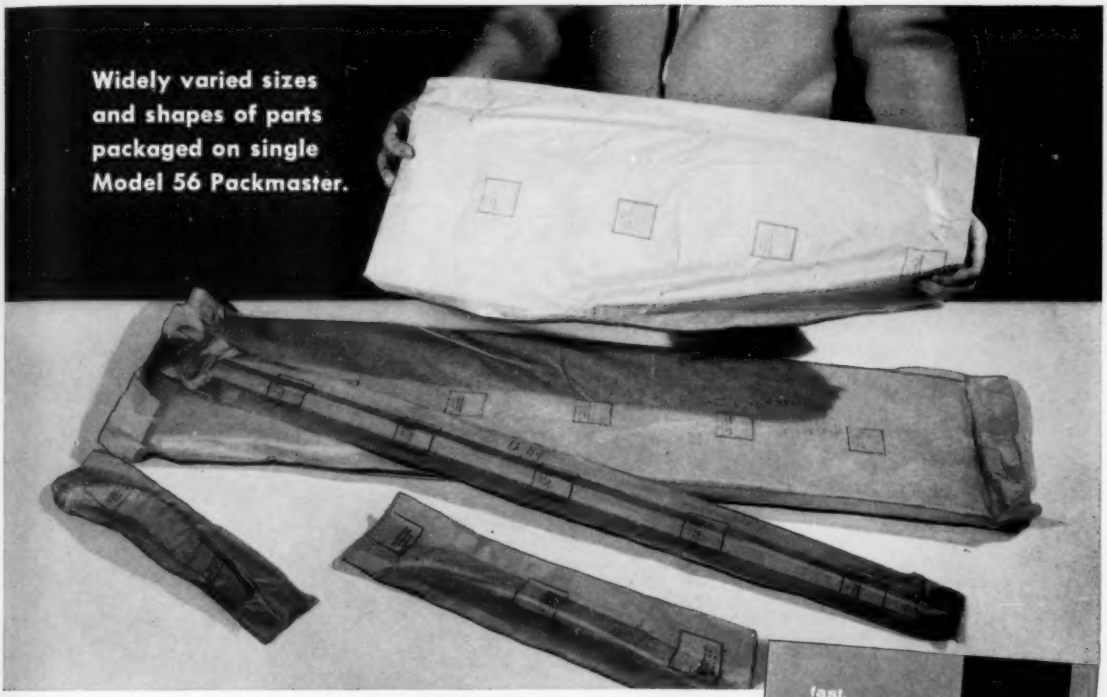
When you need help, call your Du Pont Technical Representative. He is your best source of service. His reference folder, "Properties and Uses of Cellophane", can be useful to you. Ask him for a copy or write direct to E. I. du Pont de Nemours & Co. (Inc.), Film Dept. PE-7, Nemours Bldg., Wilmington 98, Del.

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY

DU PONT cellophane

Maximum protection combined with unmatched packaging flexibility



Parts of various shapes or lengths needn't require special packaging for each configuration to insure maximum protection from corrosion, nicking or scratching. If they are between ¼ and 2 inches thick and up to 24 inches wrapping width they can be protected economically with a tough cohesive paper covering provided on the Sundstrand-Packmaster Model 56.

No adjusting is necessary — not even paper changing — as long as parts are of approximate widths and the paper is wide enough to cover the range of work. With this method, not only are these long parts packaged faster than ever before, but the tough cohesive papers conform to the shape of part, sealing it against abrasion and scratching from *both* inside and outside.

Working speed on Model 56 machines is infinitely variable between 0-120 feet per minute by means of a variable speed drive. An optional printing attachment can be provided to imprint trade marks, parts data, etc. Basic machine is 7 feet over-all but length of feed table and off bearing conveyor can be varied where required by parts being handled.

Additional Information and Specifications are available in the New Sundstrand-Packmaster Bulletin A255. Write for your copy today.

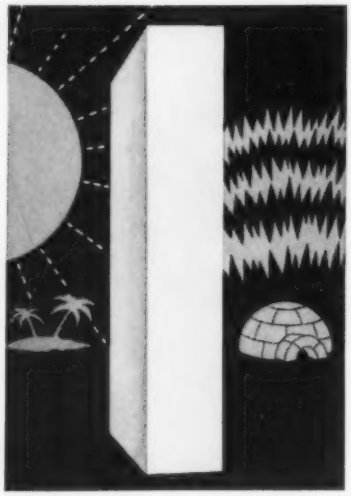
SUNDSTRAND

SUNDSTRAND - PACKMASTER

MANUFACTURED and DISTRIBUTED BY SUNDSTRAND - AMERICAN BROACH
DIVISION OF SUNDSTRAND CORPORATION, ANN ARBOR, MICHIGAN, U.S.A.

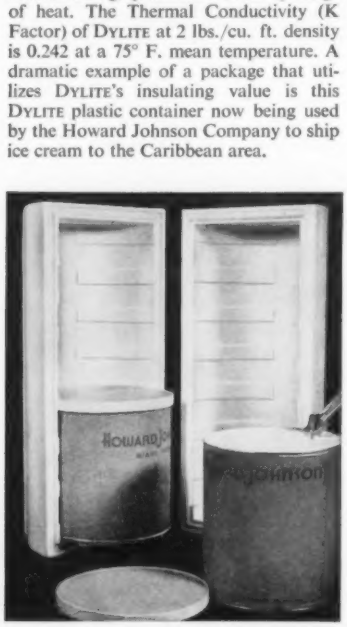
For more information circle No. 215 on Reader Service Card, Page 66

FIVE REASONS WHY
IS THE BEST ANSWER

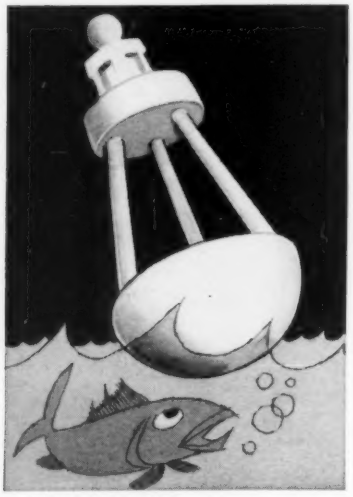


DYLITE IS AN INSULATOR

DYLITE is highly resistant to the passage of heat. The Thermal Conductivity (K Factor) of DYLITE at 2 lbs./cu. ft. density is 0.242 at a 75° F. mean temperature. A dramatic example of a package that utilizes DYLITE's insulating value is this DYLITE plastic container now being used by the Howard Johnson Company to ship ice cream to the Caribbean area.

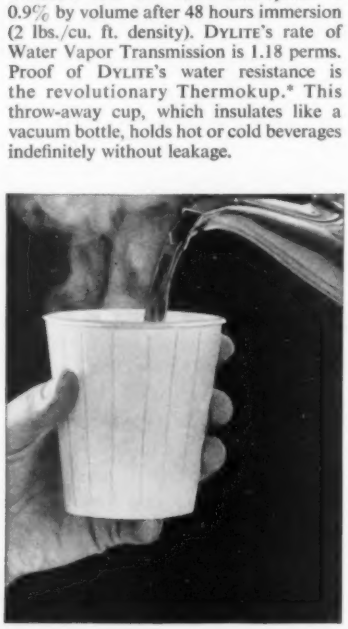


Container supplied by: The Townsend Company, Fort Lauderdale, Florida.



DYLITE IS WATER-RESISTANT

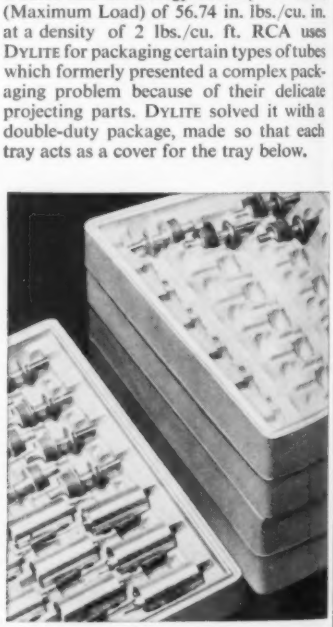
DYLITE's rate of Water Absorption is 0.9% by volume after 48 hours immersion (2 lbs./cu. ft. density). DYLITE's rate of Water Vapor Transmission is 1.18 perms. Proof of DYLITE's water resistance is the revolutionary Thermokup.* This throw-away cup, which insulates like a vacuum bottle, holds hot or cold beverages indefinitely without leakage.



Thermokup molded by: Mid-West-Pak Corporation, Belvidere, Illinois; Crown Plastic Cup Company, Fort Worth, Texas; Polychemical Industries Ltd., Edmonton, Alberta, Canada.
Patents applied for by: Crown Machine & Tool Company, Fort Worth, Texas.
**Trademark of Crown Machine & Tool Company, Fort Worth, Texas.*

DYLITE IS SHOCK-RESISTANT

DYLITE has an Energy Absorption ratio (Maximum Load) of 56.74 in. lbs./cu. in. at a density of 2 lbs./cu. ft. RCA uses DYLITE for packaging certain types of tubes which formerly presented a complex packaging problem because of their delicate projecting parts. DYLITE solved it with a double-duty package, made so that each tray acts as a cover for the tray below.



Package molded by: Sullifoam Products Co. Willow Grove, Pennsylvania.

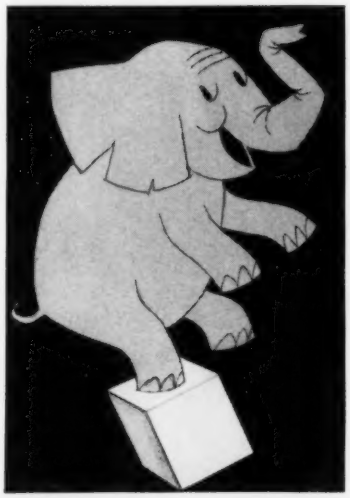
DYLITE

TO YOUR PACKAGING PROBLEMS

DYLITE IS LIGHTWEIGHT

DYLITE is lighter than cork—it can be molded in densities as low as 1 lb./cu. ft. In packaging, lightweight DYLITE helps reduce shipping costs and makes handling much easier. Notice how tight and snug the toiletries fit the DYLITE plastic tray in this Johnson & Johnson Baby Gift Set. The handy tray is removable, and can be carried about with ease.

Trays molded by: Sullifoam Products Co., Willow Grove, Pennsylvania.



DYLITE IS STRONG

A 2 lb./cu. ft. density molded DYLITE sample displays a Compressive Strength of 30 psi and a Tensile Strength of 55 psi. DYLITE's strength-to-weight ratio is excellent. Royal Electric Typewriters are now packaged and shipped in DYLITE foam cocoons. Although each typewriter weighs 47 pounds, the 3½ pound DYLITE cocoon offers complete protection.

Package molded by: Worcester Moulded Plastics, Worcester, Massachusetts.

EASE OF PROCESSING

In addition to the five outstanding properties, DYLITE is easy to handle and use because it is produced and sold in the form of small, dense beads; about the size of granules of sugar.

It can be molded into intricate shapes of uniform density to firmly cradle the packaged product. DYLITE can be painted, wrapped and decorated with a number of materials including decals, flock and sequins to provide a package with extra sales appeal.

Like to learn more about DYLITE?

If you'd like more information about DYLITE expandable polystyrene, and how it may help you answer your packaging problems, write Koppers Company, Inc., Plastics Division, Dept. PE-79, Pittsburgh 19, Pennsylvania.

DYLITE is a registered trademark of Koppers Company, Inc.

DYLENE® polystyrene, SUPER DYLAN® polyethylene and DYLAN® polyethylene are other fine plastics produced by Koppers Company, Inc.

Offices in Principal Cities • In Canada: Dominion Anilines and Chemicals Ltd., Toronto, Ontario

KOPPERS PLASTICS

KOPPERS

Keep 'em selling . . . guard their flavor with Saran Resin F220

Even a thin coating of Saran Resin F220 on your packaging film keeps flavor and freshness locked inside . . . and keeps customers coming back for more.

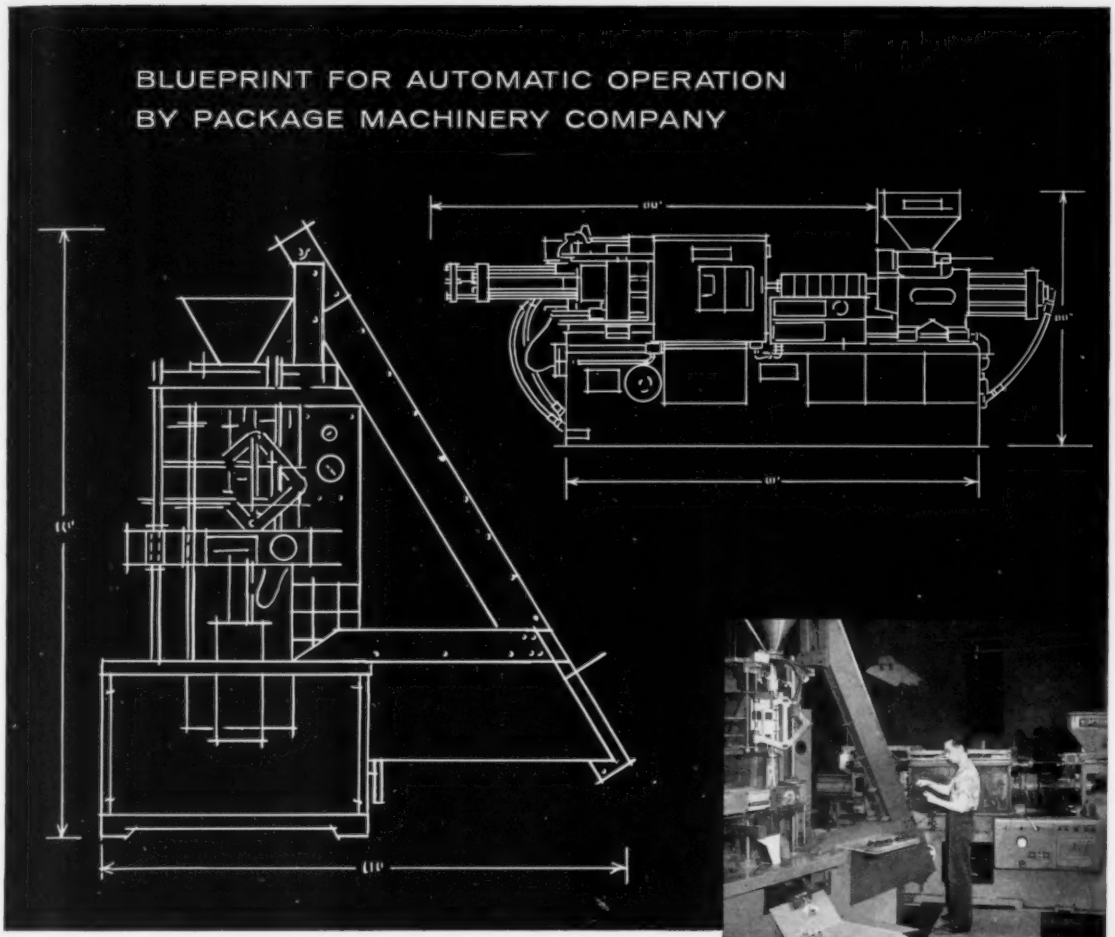
Saran Resin F220 reduces gas permeability and moisture vapor transmission to a minimum . . . increases resistance to greases, oils, acids and many organic liquids and vapors. Here is the coating that gives packaging materials a heaping measure of new protective qualities.

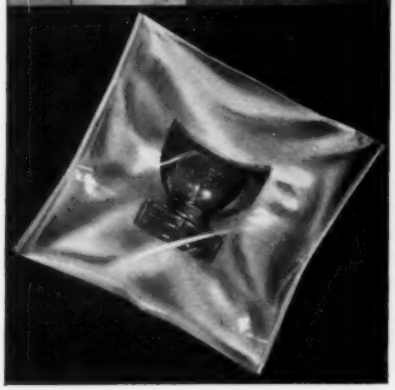
Minimum coating gives maximum protection on polyethylene, cellophane, polyester film, aluminum foil. Saran Resin F220 is soluble in acetone . . . releases solvent readily . . . and is adaptable to a wide variety of coating operations.

Whether you manufacture or use packaging film, investigate saran resins and take advantage of these sales-making properties. Write to your nearest sales office of THE DOW CHEMICAL COMPANY, Midland, Mich., Coatings Sales Dept. 2257DH-7.

YOU CAN DEPEND ON DOW

BLUEPRINT FOR AUTOMATIC OPERATION
BY PACKAGE MACHINERY COMPANY





Integrated Molding and Packaging Cuts Cost for NOSCO Plastics

"A Reed-Prentice injection molding machine was giving us excellent quality on our eyecups," said Mr. Charles Wingerter of NOSCO Plastics. "Our big problem was to individually package these eyecups automatically and economically."

Package solved NOSCO's problem by putting a Transwrap machine on the manufacturing line. The eyecups molded on a Reed 8/10 oz. machine are transferred by conveyor lift to the Transwrap. In one completely automatic operation the Transwrap forms the package, drops the eyecup into it and seals it ready for shipment to the customer. Only one person is needed to supervise the entire operation.

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Good Cookie Packaging...makes triple-play with Rhinelander Papers!

This photograph displays the versatile teamwork of Rhinelander Glassine and Greaseproof papers in providing excellent three-way package protection for chocolate peppermint cookies. ① Corrugated Glassine is laminated to chipboard. This gives added strength to the overall package, prevents staining, and cushions its contents against damage. ② The inner dividers and trays of corrugated Greaseproof provide support against shock and staining. ③ Fluted cookie cups of rich red Glassine add a pleasing note of color and give greaseproof and shock protection.

These economical Rhinelander papers perform well on modern laminating and packaging equipment. Write for samples and complete information for the packaging of your product.

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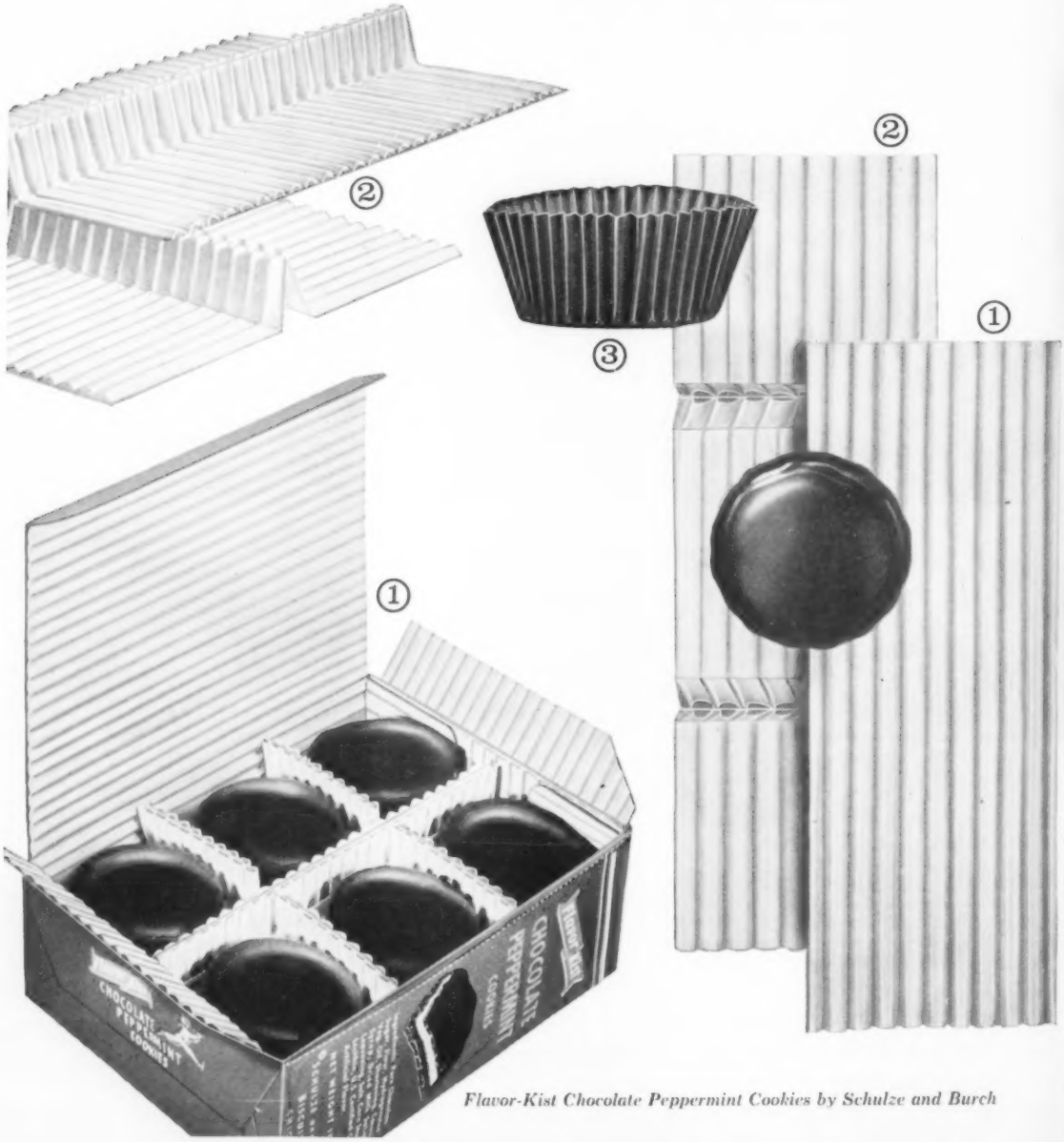
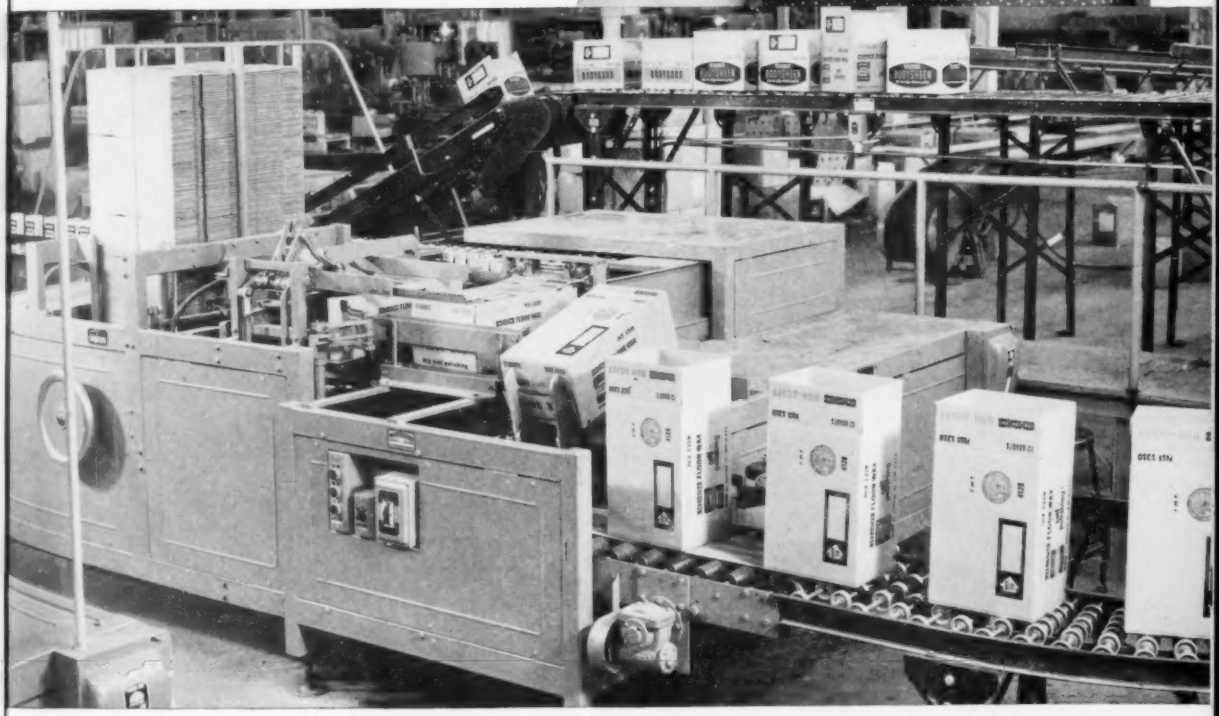


Flavor-Kist Chocolate Peppermint Cookies by Schulze and Burch

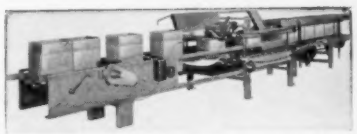
Simoniz puts "protection" in a can

Packomatic® puts the cans in a case



Packomatic equipment feeds, forms, positions, loads, seals and imprints corrugated shipping containers automatically. However you ship—in multi-ply paper bags, or in corrugated shipping containers; whatever you "package"—a can, a carton, a box or a bale—there's a Packomatic machine designed to handle your shipping container requirements. Packomatic machines, geared to your production line, will feed, form, position, load, seal and imprint corrugated containers automatically—or do any of these operations singly as a complement to your existing packaging facilities. Let one of our sales engineers suggest the start of a long-range packaging program for your plant. Investigate the Packomatic method of cutting costs and boosting production. Call, write or wire today.

Fully-automatic Packomatic Case Former-Loader, part of a fully-automated production line at the Simoniz plant, Kankakee, Illinois. Other Packomatics on the Simoniz line include Case Sealers and Case Imprinters.



Begin to automate your packaging line with this high-speed, fully-automatic Case Sealer. Aligns loaded cases, positions flaps, glues, seals and discharges — and no operator needed! Available in wide range of sizes. Semi-automatic, too. Call or write for additional information.

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PACKOMATICS include the Bale Sealer • Case Sealers • Opener-Loaders • Case Imprinters • Telescoping Volumetric Fillers • Packer-Gluers • Semi-automatic or fully-automatic.

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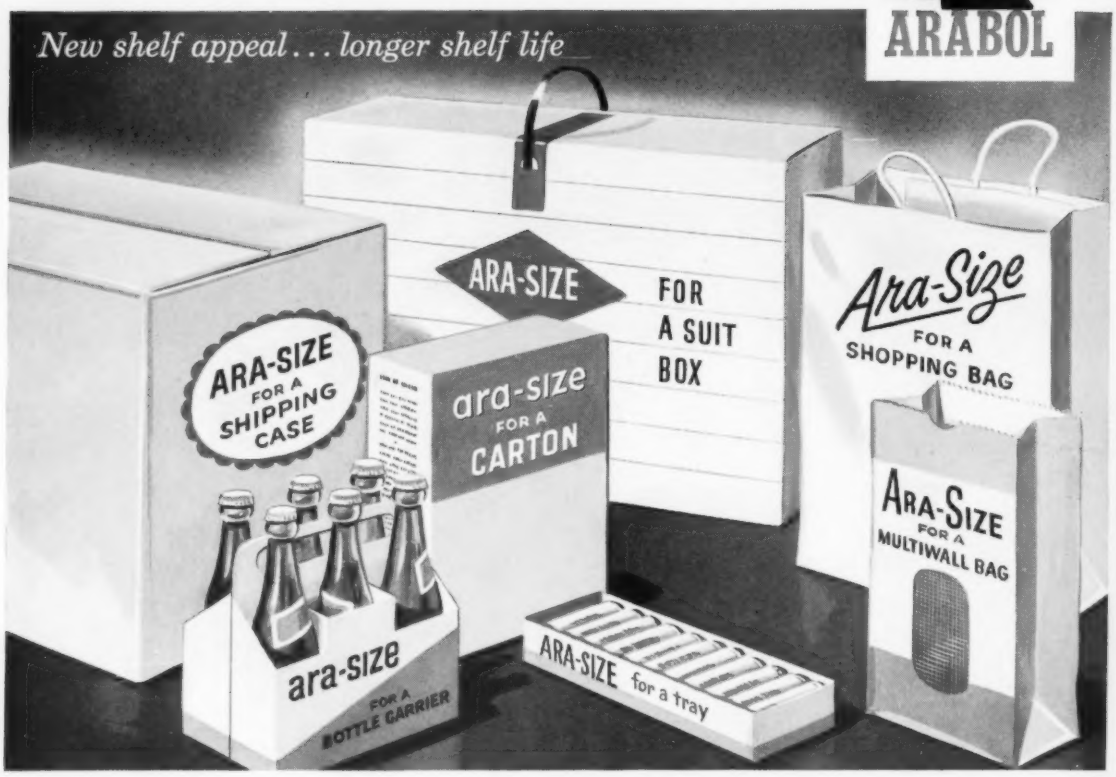
Headquarters for SPECIFICATION ADHESIVES

ARABOL


New shelf appeal... longer shelf life
ARA-SIZE FOR A SUIT BOX
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FINER PRINTING... on any grade of paper or paperboard

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Ara-Size upgrades paper and paperboard by sealing the pores, giving a smooth "plastic" effect. This reduces the absorption of ink and prevents rub-off. The improved printability of the surface and the saving in ink are only two of the advantages gained.

The paper or board gains in density; the flow of air through the stock is greatly reduced. Scoring and bending are facilitated. Opacity can be increased or reduced. Ara-Size can be tinted in pastel colors.

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Just as with ARABOL Adhesives—Ara-Size can be specification-formulated to each of your particular uses and application methods—by roller, knife-coating, flexographic and other methods. Ara-Size can be applied by the mill or the converter.

Ara-Size is particularly offered for bottle and can carriers, folding boxes, cartons, trays, suit boxes, shipping cases, single and multi-wall bags, shopping bags. Let us discuss the full details in terms of your uses. Write or phone any of the ARABOL plants and warehouses listed below.

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74 YEARS OF PIONEERING IN THE MAKING OF ADHESIVES

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Circle No. 222 on Card, Page 66

New from International Paper!

New grease-resistant **KREOCOAT** by International Paper is 5 ways better than laminated bleached board

(—and one of them is, it's cheaper!)

KREOCOAT is a dramatic new grease-resistant solid bleached board. It is already being used to package such products as frozen chicken, cookies, bacon and other meats, and brown 'n serve baked goods. Independent box makers, particularly, find this highly printable machine-coated board ideal for today's competitive conditions.

Here's why International Paper's Kreocoat is better than laminated board:

1. There's no curl. Kreocoat lies flat. Its coating is an *integral* part of the board. It can't delaminate—ever!

2. Less inventory. Kreocoat's *versatility* lets you cut your inventory. You no longer have to tie up dollars and costly warehouse space to stock both laminates and other boards.

3. Less handling. Kreocoat comes to you ready for converting. There is no laminating operation—and Kreocoat can be glued with conventional adhesives.

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5. Lower cost. Kreocoat is not only cheaper to buy, it is also cheaper to store, cheaper to convert, cheaper to salvage.

Contact your International Paper salesman for samples and information.

Fine Paper & Bleached Board Division **INTERNATIONAL PAPER** New York 17, N. Y.

How to change the course of your business with the right change in packaging

Naturally, that's what you'd like to do ... the question is HOW? The answer could be right in this label

BETTER PACKAGING
ALCOA® WRAP
ALUMINUM COMPANY OF AMERICA

Exactly what does this label mean?

It means—Alcoa, with the greatest fund of aluminum knowledge in the world . . . Alcoa, with the only full-scale packaging laboratory in the country, where we can test ideas, check costs, answer all problems from design to package performance . . . Alcoa, teamed with their converter specialists to provide so much more than any single company can—top facilities, top service, top know-how, all along the line.

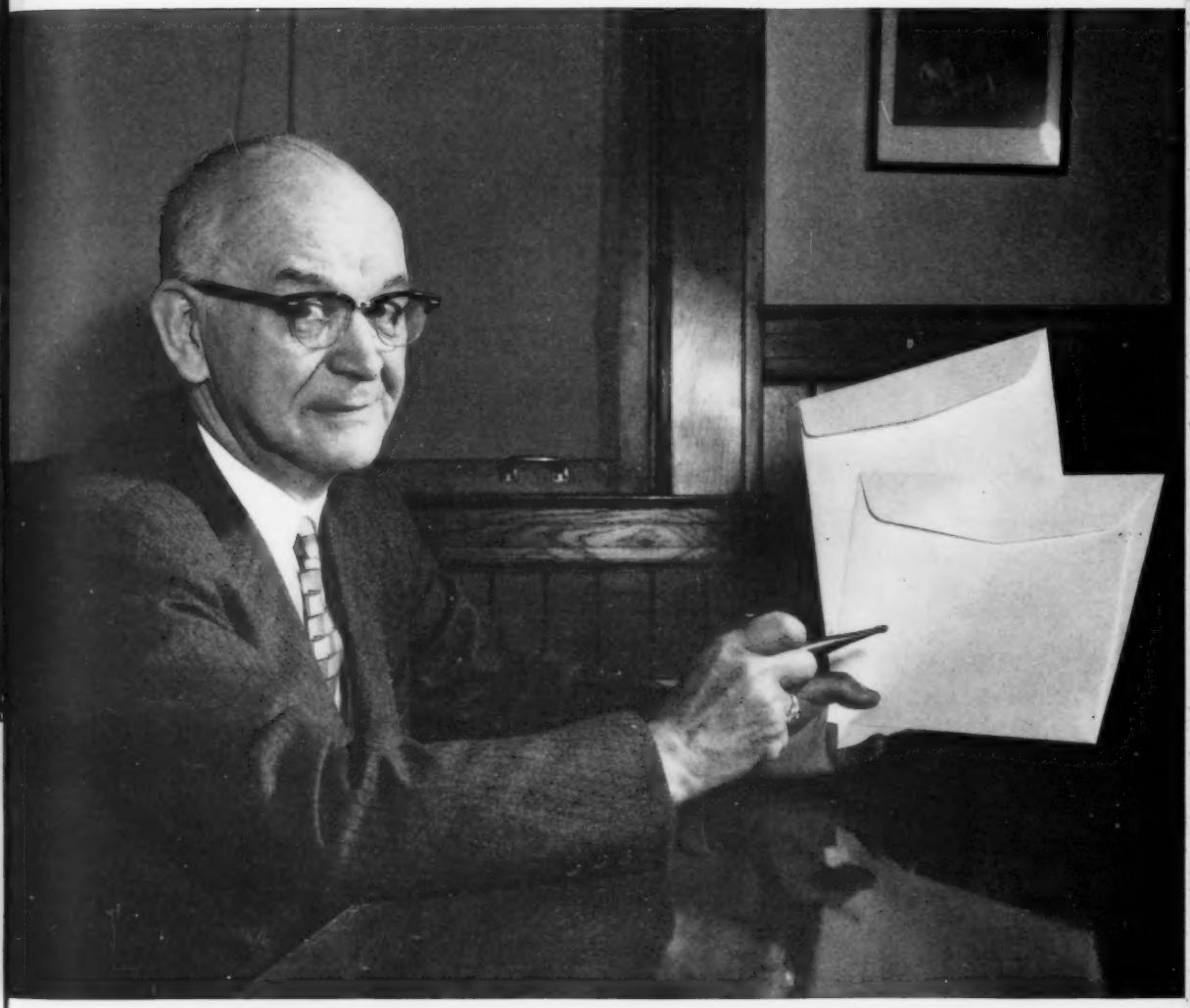
Does your packaging need improving? Whatever your plans or problems, we're all set to tackle them. Call your Alcoa salesman or write Aluminum Company of America, 1657-G Alcoa Building, Pittsburgh 19, Pa.

You're always ahead with Alcoa . . . greatest name in aluminum

For more information circle No. 223 on Reader Service Card, Page 66

"We have found Nibroc Armor·Glo ideal for our Lines of Dura-Mail Envelopes"

says J. A. Chadbourne, President, Old Colony Envelope Company, Westfield, Mass.



"Our objective is to always make the best envelopes possible," he continues. "We constantly evaluate papers and have found that Nibroc Armor·Glo meets our requirements for strength and whiteness. We have used this excellent paper in our Dura-Mail envelope lines for two decades and sales have increased yearly."

If you too want the strongest, whitest envelope kraft on the market, use Nibroc® Armor·Glo. It lies flat, cuts, trims and handles well. Nibroc® Armor·Glo takes adhesives perfectly . . . has excellent opacity and printing surface—is competitively priced.

If you want the finest in envelope paper let us add your name to our list of customers who receive advance notices of our frequent runs. Address Dept. **RK-7,** Boston office.

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Another Quality Product of

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THE MAN WITH THE ★ MULTIWALL PLAN

UNION
PACKAGING SPECIALIST
"WHITEY" CAMPBELL

shows packer how to pocket $85,000

$85,000! That's the *annual* dollar savings one user of Multiwall bags will enjoy as a result of a recent Union packaging survey.

The survey, made by Union Packaging Specialist "Whitey" Campbell, showed that: (1) $57,000 a year could be saved simply by switching the company's 3-ply domestic baler bags to 2-ply's. (2) reinforced sewing construction on 100-lb. packages would save 20# basis weight per bag . . . and additional thousands of dollars in costs depending on the number of bags used.

Union Multiwall Recommendations are based on this 5-Star Packaging Efficiency Plan

- DESIGN
- EQUIPMENT
- CONSTRUCTION
- SPECIFICATION CONTROL
- PLANT SURVEY

These were the major recommendations made and put into effect through Union's 5-Star Packaging Efficiency Plan. Total savings are expected to amount to more than $85,000 when all improvements are completed. How much could this plan save you?

Better Multiwall performance through better planning

union camp

UNION'S PACKAGE ENGINEERING DEPARTMENT will study your Multiwall bagging methods and equipment and make appropriate recommendations, regardless of the brand of Multiwalls you are now using.

UNION MULTIWALL BAGS
UNION BAG-CAMP PAPER CORPORATION
233 BROADWAY, NEW YORK 7, N. Y.

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STEEL PAILS AND DRUMS . . . AT YOUR FINGERTIPS WITH VULCAN'S FAST DELIVERY! Now you can save time and money on *all* steel container orders because Vulcan's service is almost like having a steel pail and drum supply right in your office! Vulcan stocks all popular sizes and gauges of steel pails and drums and through constant inventory control knows precisely the quantity and description of the stock on hand. Thus, when an order comes in—large or small—it is accurately and speedily processed, filled, and assigned a delivery date. This speed and efficiency is evident in the way Vulcan serves all its customers.

MAKE VULCAN YOUR PRIME SOURCE FOR . . .

STEEL DRUMS
15, 30, and 55 gallon and larger capacities in Open and Tight Head styles. 120-110-100 lb. grease drums. Agitator Drums.

STEEL PAILS
Open and Tight Head 1 through 12 gallon capacities.

THE VULCAN "PACKETTE." New palletized pail shipping method saves time and money.

"UNI-DRUMS" with interlocking hoops. The greatest advance in drum design in decades!

HI-BAKE LININGS. Vulcan has a HI-BAKE lining for your product or will work with you in developing one!

FITTINGS AND ACCESSORIES. A wide variety of closures and spouts are available on pails and drums.

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Gentlemen: I am interested in:

☐ Pails ☐ "Packette"
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Company_____

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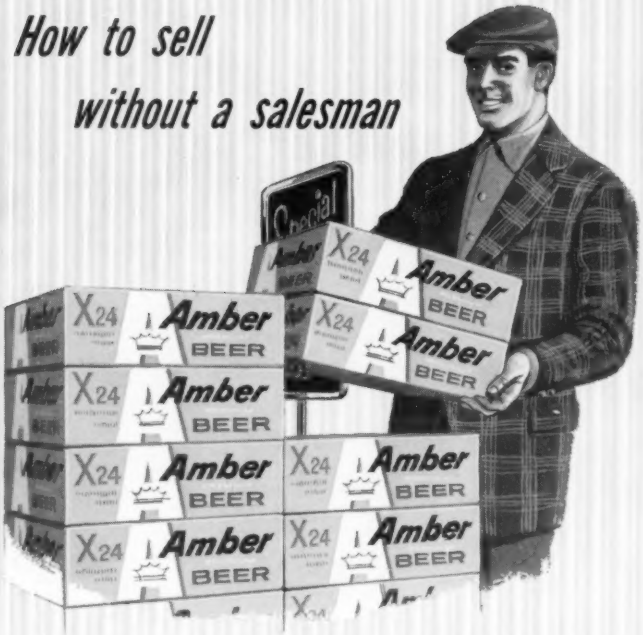
City_____ Zone___ State_____

For more information circle No. 226 on Reader Service Card, Page 66

How to sell
without a salesman



Customers handle
their own cases when your
brand's in colorful, lightweight
H & D corrugated boxes.
They're easy to carry—attractively
printed to out-merchandise competition.
Is your brand point-of-sold?
Better see H & D.

Hinde & Dauch
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15 FACTORIES • 42 SALES OFFICES

1 Four drum filling lines, equipped with semiautomatic fillers which have been recently installed to increase total capacity by 50 per cent. Lines are laid out in pairs, each line a mirror image of its twin, with the two fillers on each pair facing one another.

Semiautomatic fillers speed up drum lines

By B. J. Prost,
Supervisor of Technical Services,
Cities Service Oil Company,
Cicero, Illinois

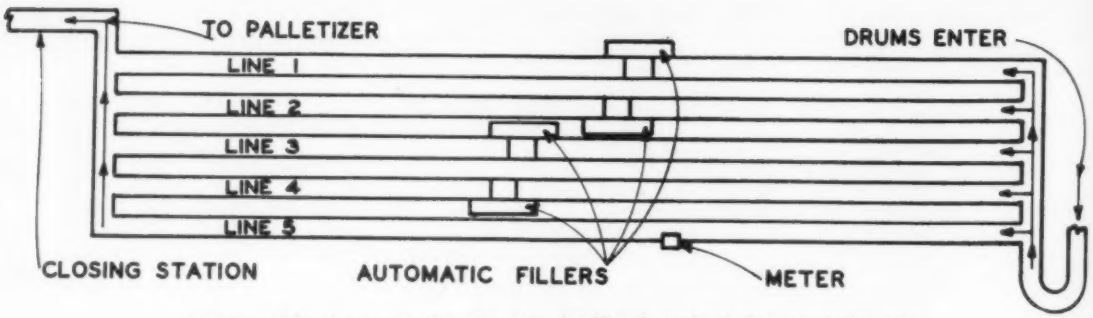
We have recently installed four semiautomatic drum fillers on four of our five existing lines. The number five line is equipped with the original meter and is used as a supplement to the automatic fillers. Our present capacity is about 1200 drums per day as compared to about 800 drums per day with our previous equipment.

Increase Capacity 50 Per Cent

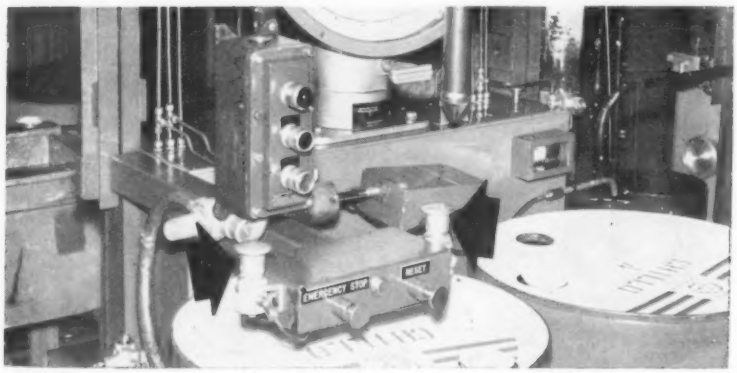
Present operation makes use of one operator for each two automatic fillers, and one operator for the number five line. We, also, now utilize one man to operate a central bung-tightening and sealing station which services all lines. The net result of our modernization was a 50 per cent increase in capacity.

All four of our new lines (see

Changing from metering type to semiautomatic equipment has resulted in a 50 per cent increase in capacity in Cities Service's lines for filling oil in 55-gal. drums. And no additional floor space is required. Describing the layout of the lines, Mr. Prost points out that the four lines are laid out in pairs to allow one operator to attend two fillers. He also tells of a simple empty drum feed mechanism which the company designed and built for the purpose of providing one drum at a time for filling.



2 Layout of four lines arranged in pairs. Note that fillers for each twin face one another with their center lines staggered about 2 ft. Thus operator pivots only 180° to operate each filler. No. 5 line has original meter and supplements automatic fillers.



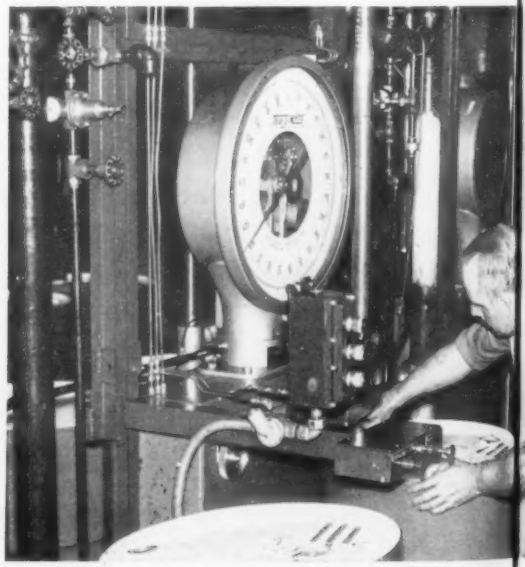
3 Control panel is located conveniently on pedestal at left side of filler. Note readily accesible palm buttons (arrows) for controlling air-operated empty drum feed mechanism which the company designed and built (see Figs. 6 and 7.)

Figs. 1 and 2) have identical equipment. Each consists of a gravity conveyor approximately 70 ft. long, running from a common empty drum supply conveyor to a filled drum accumulator conveyor, and eventually to the closing station.

Lines Are In Pairs

The four lines are laid out in pairs, each being a mirror image of its twin. A catwalk in between each set of twins accommodates the operator. The Mantes fillers are located about midway down the conveyor, allowing an accumulation of about 15 empty drums in front

4 After empty drum is fed to filler platform, operator positions open drum under filling lance (arrow). Note that scale records tare weight of drum. After automatic tare mechanism compensates for weight of empty drums, scale pointer returns to zero, lance enters drum, then flow of oil begins.



5 Oil flows at rate of 120 gal./min. to a preset weight. Then dribble cycle completes fill after which lance withdraws automatically. Scale shows net weight; then records gross weight. Operator then finger tightens bung and pushes drum off platform.

of the fillers and about 15 filled drums after the fillers.

The fillers for each twin set of lines face each other with their center lines staggered about 2 ft. The filler controls (see Fig. 3) are located conveniently on an extended pedestal on the left side of each filler. **Thus, an operator need only pivot 180° to operate each filler.**

Filling Operation Is Simple

The sequence of operation of the fillers is relatively simple. The operator presses a palm button on the control pedestal which automatically feeds an empty drum onto the filler platform. He then positions the open drum under the filling lance, (see Fig. 4) and presses the start button. (The filling lance is nothing more than a filling pipe which enables subsurface filling of the product. The lance withdraws as the level of oil in the drum increases, which eliminates any overflow due to the displacement of the oil by the lance.)

The filling lance drops to within 2 in. of the bottom of the drum while the automatic tare mechanism is compensating for the weight of the empty drum. **The flow of oil does not start until the scale is exactly at zero.** The oil is pumped into the drum at the rate of 120 gal./min. until a preset weight is in the drum, at which point a dribble cycle commences. The dribble cycle is stopped at the preset weight of oil to be filled, and the lance is automatically withdrawn from the drum.

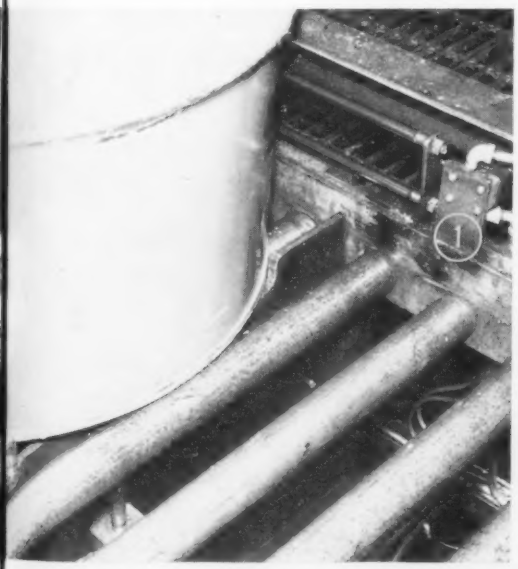
B. S. Prost holds a B. S. degree in chemistry from Roosevelt College and has done graduate work in business administration at Northwestern University. Now superivsor of technical services for Cities Service Oil Company, he has also been chemist and grease manufacturing supervisor for the same firm. Mr. Prost is a member of American Chemical Society and American Material Handling Society.

Drum Feed Mechanism

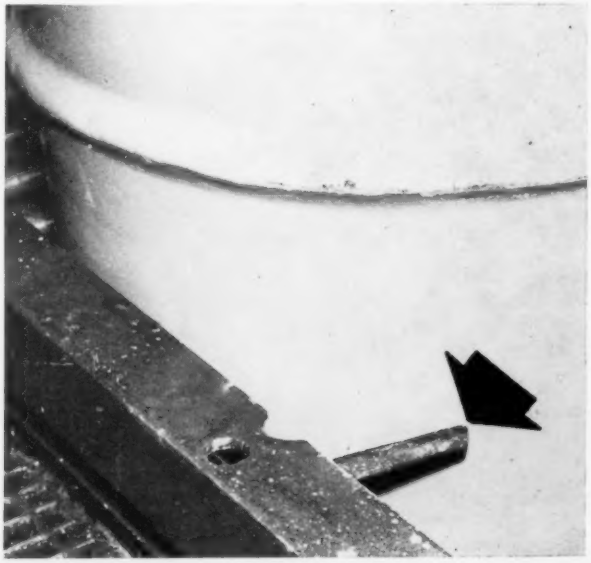
The Detecto scale reads the net weight of the oil in the drum for several seconds, then records the total gross weight of the drum. The automatic cycle is then complete. The operator then finger tightens the bung (see Fig. 5), and the drum is pushed off the filling platform into the gravity accumulator section of the line.

The empty drum feed mechanism we designed and built is for the purpose of providing one drum at a time readily available for filling. The mechanism itself is composed of an automatically controlled air cylinder pushing a spring-loaded finger which, in turn, pushes the empty drums. A series of air-operated drum stops regulates the flow of drums. (See Figs. 6 and 7.)

The filled drums are released from their gravity accumulator lines in groups of four to the sealing station. This is accomplished by means of air-operated drum stops with their controls at the sealing station. The reason for the four drums to a group is to accommodate the automatic drum palletizer which is located 80 ft. beyond the sealing station. *(End)*



6 When actuated, air valve (1) causes stop (2) to drop, freeing drum to be pushed along conveyor. Simultaneously, finger (see Fig. 7) pushes drum clear of stop, after which air valve automatically returns stop to position shown above to halt next drum.



7 Finger (arrow) is pushed by automatically controlled air cylinder, and, in turn, pushes empty drum. Finger is actuated simultaneously with dropping of drum stop (see Fig. 6). Being spring-loaded, when finger returns to position shown above, it folds forward as following drum approaches stop.

On the basis of a food product's predetermined needs, theoretically, it should be possible to select the "right" packaging material for it. But in practice, this does not often work. In describing a systematic approach to the testing of packaging materials for a given food, Dr. Birdsall explains how to set up the test, stressing the needs of using enough packages and of simulating actual handling. He cites various quality tests applicable to package testing — including tests for sensory and physical characteristics. Stating that certain vitamins serve as excellent indices of quality, he points out that the rate of their destruction can be used to compare packages. He cautions against the possibility of product/package interaction which might produce toxic compounds.

Food in flexible packaging

By John J. Birdsall,
Assistant Director, Laboratory Projects, Wisconsin Alumni Research Foundation, Madison, Wisconsin

The most effective means today of selecting a suitable package for a food product is to predetermine the product's packaging needs, prepare and test several possible candidate containers which will meet those needs, and, on the basis of information obtained in the tests *and* economics, choose a package for the product. It sounds simple enough, but when one considers the many factors involved, it becomes somewhat more complex.

Fig. 1. Flavor evaluation panel in session. To find slight flavor differences, usually trained judges are used, employing methods such as paired comparisons, triangular comparisons, ranking, and scoring; for broad differences, untrained panels are best, using preference rating techniques.

What package for what product?

A conservative estimate would list the number of flexible packaging materials and combinations of materials available today at 200. This figure does not reflect all of the many combinations and laminations available or the different manufacturers of the same material. Because of the large number of materials which can be considered for use, **the first step in the selection procedure must screen out all but those whose physical characteristics comply with the product requirements.**

Brickman *(3)* has discussed thoroughly the steps involved in predetermining a product's physical packaging needs and the initial selection of candidate materials. Theoretically, it should be possible to select one specific type of material for a product solely on the basis of its predetermined needs. In practice, however, this usually does not work. It is not possible to determine what might possibly occur during the extremes of normal handling. More specifically, one is often not able to foresee possible product-package interaction and subsequent detriment to quality. Recognition of the requirements given by Brickman should, however, narrow the candidate materials to only a few.

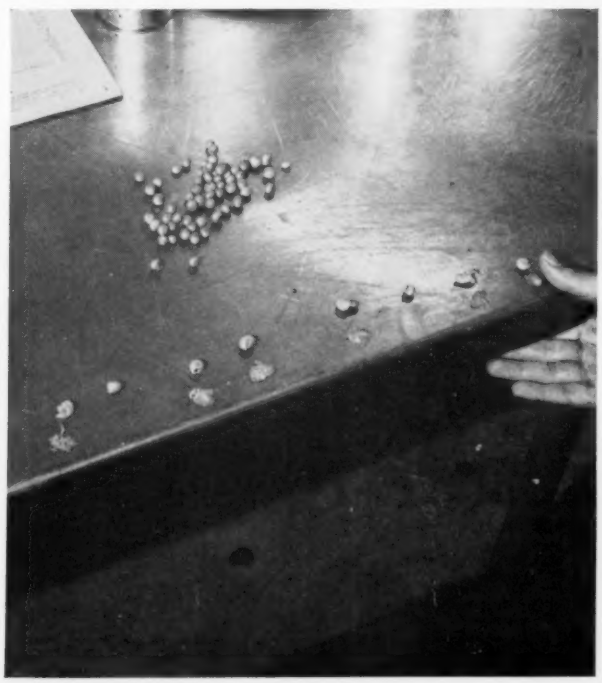
HOW TO SET UP THE TEST

With only a few materials to evaluate, **the next step is to prepare experimental packages for the food product.** The packages should be prepared, if possible, in the sizes and forms in which they might eventually appear on the market. This is desirable in order to eliminate the necessity of making approximations or adjustments when interpreting results. Conditions of filling and sealing the packages should closely approximate those which might be obtained in actual practice.

The most important factor in this regard is that the product

Fig. 2. Using Hunter Color Difference meter to study darkening of food during storage. Instrument readings and visual ratings are valuable where color is factor in comparing packages.

Fig. 3. In simple "pinch" test for determining relative textures of some foods, expert pinches product between thumb and forefinger. Tests are useful indices for quality changes in many foods which may be packaged in flexible materials.



should be given as severe a treatment during filling and sealing as would be encountered under production conditions. The tendency is to handle the experimental food very carefully, and as a result, the packaged product may be of higher quality than can be obtained with ordinary equipment. This could result in misleading information from the subsequent tests.

Test Enough Packages

Enough packages of each type of material should be set up so that as many tests as desired may be conducted at any given storage interval. Factors which must be considered in determining the number of packages to prepare are:

(1) Storage time.
(2) Frequency intervals at which samples are tested.
(3) Quality characteristics to be measured.
(4) The amounts of product needed for each quality test.

For example: If the assumed storage time is three months, and samples are to be tested for four quality characteristics at each of 12 weekly intervals, and one pound of product is sufficient for all tests, it would be necessary to prepare a minimum of 12 one-pound packages or their equivalent. Most tests should be run in duplicate, however, and extra sample packages should be included to allow extension of the storage period if necessary. This, plus the packages used for the initial, or 0 time tests, would bring the number of packages necessary for each type of material to 30 or more in this example.

Simulate Actual Handling

Storage of the test packages should be conducted under the exact conditions which will be encountered in commercial handling. Variables which must be considered in establishing these conditions are temperature, degree of handling, lighting, humidity, and, most important, time. One might even wish to include the possibility of insect or microbial infestations. Much of the information concerning commercial handling conditions can be obtained from the quality control and marketing departments of the firm. If not readily available, this data should be accumulated by means of a survey of some kind prior to conducting the tests. An example of the type of information needed to establish test conditions is the following, typical of the commercial handling of oleomargarine:

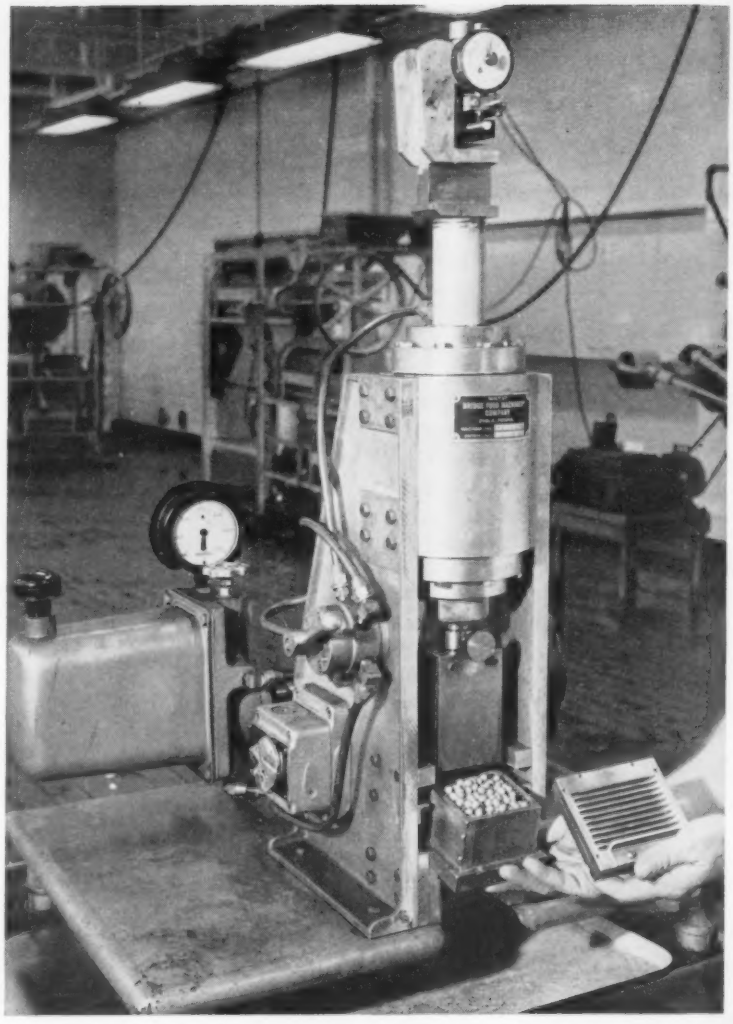


Fig. 4. Shear press for checking texture in foods. Shear-force is used extensively to determine tenderness of steaks.

Operation	Time (days)	Lighting (ft.-candles)	Temperature (°F.)	Relative humidity (%)
Plant packing and storage	7	Minimal	50	35-40
Shipping	1-2	Minimal	75	Ambient
Warehouse storage	21	Minimal	50	35-40
Shipping and storage in store	2-4	Minimal	75	Ambient
Store display	1-60	100	75	Ambient
or				
Store display	1-60	100	50	Ambient

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Once such a schedule has been determined, the conditions to be employed can be established to simulate actual handling. **The storage intervals at which the product should be tested for quality should be spaced according to the storage conditions and the normal stability characteristics expected of the product.**

WHAT FACTORS TO MEASURE

Obviously, exacting tests are required to separate closely similar materials and to evaluate the packages under the conditions imposed. Dependent upon the product and its potential shelf life, a wide variety of tests can be conducted to show differences and provide the means of selecting the best package. The discussion which follows will describe various food product quality tests and their application to package testing.

SENSORY CHARACTERISTICS

The single most important factor to be measured and compared is *flavor*, for flavor is essential to consumer acceptance. Although this quality factor is not readily measured objectively, there are available some excellent, precise, subjective methods of flavor evaluation. Unfortunately, there are no standard methods for certain types of problems. Each investigator, therefore, uses the method which appeals to him most or which is easiest to interpret. We will cite here those examples which we feel will be most applicable to package testing programs.

Slight Vs. Broad Differences

For the most part, the determinations of flavor differences or preferences among foods packaged in different materials can be divided into two basic groups: those designed to detect very slight differences and those designed to show broader differences in flavor preference.

Slight differences in flavor are of interest when the packages under test are expected to be very similar in their effects upon the product. Expert or trained judges are usually used to find these slight differences. **Methods** which have been employed with trained judges **include paired comparisons, triangular comparisons, ranking,** and **scoring.**

Deatherage and Garnatz used the paired comparison method to advantage in comparing the preference of broiled steaks from matched shortloins which were aged differently (*6*). In this case, it was simply a matter of which

Fig. 5. Vitamin assay in laboratory. Certain vitamins serve as excellent indices of quality, and have been used to detect differences among experimental packages, by following their rate of destruction.

of two steaks tasted was preferred. Appropriate statistical analysis then told whether one sample was significantly better than the other. **If applied to a packaging study the paired comparison method would be desirable to distinguish between two materials which had a similar effect on the food product and whose cost or merchandising characteristics were also quite similar.**

Spotting The Differences

An example of the use of the triangular comparison method is found in the work of Mylne and Seamans (*10*). They used this test to compare the flavor of orange feed material with orange juice powder to see whether any flavor changes had occurred during processing. The two samples to be compared (a and b) were presented to the panel in these possible ways: **aab, aba, baa, abb, bab,** and **bba.** The degree of difference between the samples was estimated by the number of times the panel could correctly identify the like samples in each set of three. **This test is of special interest in packaging studies when it is desired to tell whether a new package is different from the current standard package, regardless of whether it is better or poorer.**

Ranking can also frequently be used in package evaluation work. Parks has described a procedure where as many as 19 samples were ranked by a small trained panel (*8*). The samples were ranked in groups and the relative ranks analyzed statistically to determine differences. This technique has been applied to many food products, including dried milk, dried eggs, ice cream, coffee, meats, fats, and oils.

Scoring is more easily analyzed statistically and is therefore more frequently applied to flavor evaluation than ranking tests. Expert scoring has been used in packaging studies and is demonstrated in a paper by the author (*2*). In the study of milk flavor as affected by packaging, a scoring system was used which allows a total of 45 points for the flavor of milk (*7*). Points are deducted from 45 when defects are found in the sample. Most good, fresh, clean-tasting milk rates a score of 39.5 while oxidized milk is 34 or below. Similar scoring scales can be set up for any food product under consideration.

Using Untrained Panels

Broad differences in flavor are best evaluated by untrained panels. The techniques most frequently used are those employing a system of preference rating known as the hedonic scale (*11*). This method allows the judge to score each sample according to its relative position on a preference scale such as the following:

Like very much
Like moderately
Like slightly
Neither like or dislike
Dislike moderately
Dislike slightly
Dislike very much

The word descriptions are assigned numerical values and analyzed statistically to determine differences in preference among the samples. This technique has been used extensively in flavor studies by many workers. Its direct application to packaging studies is demonstrated in a paper by Birdsall and Teply (*1*). In this study, the technique was used to show preference differences among fresh brown-and-serve rolls wrapped in foil, waxed paper, and cellophane.

The *odor* of food products may also be affected by packaging. **It is advisable to include odor evaluation in any package testing program.** Normally this can be done in conjunction with the flavor evaluation tests. Odor is most easily checked by using a scale such as the following:

0 = Normal odor, no detectable off-odor
1 = Slight off-odor
2 = Moderate off-odor
3 = Strong off-odor

If the product is identified with a distinct and characteristic appealing odor, such as that of freshly baked bread, it should be determined which of the experimental materials most effectively preserves the desirable odor.

PHYSICAL CHARACTERISTICS

Quality characteristics other than flavor should be investigated in any package evaluation program. The physical and chemical properties of the food product may be altered during storage to effect changes in acidity, specific gravity, refractive index, color, consistency, and texture. For certain food products, these factors are reliable indices of the degree of protection afforded by the package.

In a study of sauerkraut *color* as affected by various factors when packaged in Pliofilm bags, Sedky, Stein, and Weckel employed both colors as an index of quality change (*14*). Color was measured with a Hunter Color Difference meter and reflected the degree of darkening of the sauerkraut during storage. In addition to the instrument readings, visual color ratings were obtained. Both of these techniques are valuable where color is a factor in comparing packages. Since there is almost no food product of which color is not an important selling point, **the measurement of color is vital to package evaluation studies.** Many instruments and visual techniques are available for the measurement of color in foods (*4*).

Properties To Watch

Acidity is especially important in fruit juices, olives, and pickles. If one were to compare various flexible packages for dill pickles, for example, it would be extremely valuable to see what effect the package had on the acidity of the product at various stages of storage. Measurements of acidity are conducted with pH meters and colorimetric titrations or indicators.

Specific gravity is an important quality index for fruits and fruit juices, and may be readily measured by various types of hydrometers or by weight comparisons. When combined with a measurement of acidity (Brix-acid ratio, for instance) in fruits, it provides

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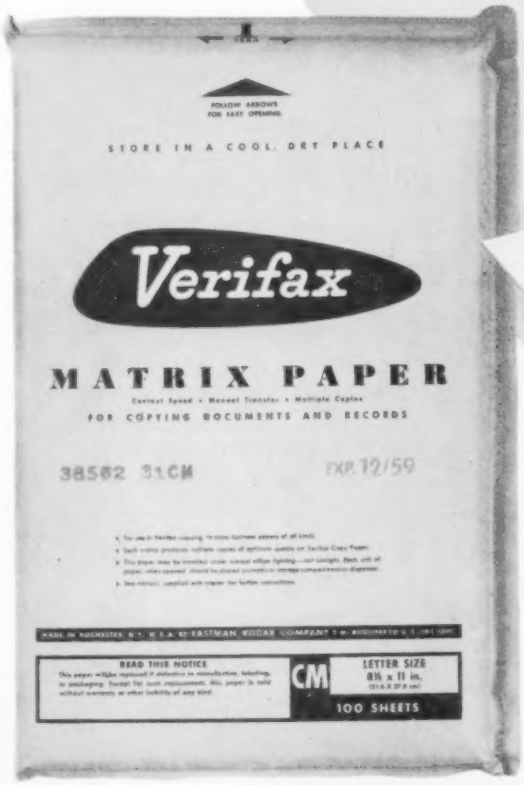

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an accurate index for quality preference. If a fruit and sugar syrup mixture were packaged in various test flexible films, it would be beneficial to compare the packages on the basis of their relative effects upon the Brix-acid ratio of the product after specified storage intervals.

In products such as honey, where soluble solids content is of great importance, the refractometer is used as an index of quality. The *refractive index* tells the amount of sugar in a sample by the way in which the sample bends a light beam. Packing honey or similar products in experimental packaging materials would necessitate measuring the refractive index to make quality comparisons.

The *consistency,* or flow rate, of a product is also an important physical characteristic to test. The flow of catsup from a flexible tube, for instance, must be considered when testing experimental materials. Tests for flow or consistency are described by Davis, *et al.,* and include a number of instruments for various products (*5*).

Texture tests are very useful indices for quality changes in many foods such as cheese, bread, candy, cereals, meats, and fruits, all of which may be packaged in flexible materials. The simplest texture test is that called the "pinch" test in which the relative texture of the product is determined by an expert who simply pinches the food between thumb and forefinger (*15*).

More intricate devices include various types of tenderometers, texturemeters, puncture testers and shearing instruments. Shear-force has been used extensively to determine the tenderness of steaks (*6*). This measurement is of considerable value in comparing the tenderness of prepackaged meat cuts where the relative degree of tenderness may be affected by the type of packaging material used.

Nutritional Properties

Certain vitamins also serve as excellent indices of quality and have been used to determine differences among experimental packages. The rate of destruction of *vitamin C* (ascorbic acid) has been used to compare packages in a number of studies. Sedky, *et al.,* measured vitamin C as an index of the rate of oxidation of sauerkraut packaged in Pliofilm bags (*14*).

Vitamin C is very sensitive to oxygen and its destruction is catalyzed by light, iron, and copper. We have used the *rate* of destruction of this vitamin to show differences among packages designed to protect milk and various milk products (*2*). The vitamin C content of the product is measured at the beginning of the test and after various periods of storage.

As oxidation of the product proceeds, the amount and form of ascorbic acid changes. Reduced ascorbic acid is oxidized to dehydroascorbic acid which in turn is oxidized to diketogulonic acid which is inactive as a vitamin. The rate of oxidation of reduced ascorbic acid to dehydroascorbic acid is perhaps the most important change to observe since it provides the best indication of the rate of oxidation of the product and correlates very well with other changes which occur (i.e. color and flavor). These changes in vitamin C can be measured in most products by the use of the methods of Robinson and Stotz, or of Roe (*12, 13*).

Riboflavin, one of the B vitamins, happens to be quite sensitive to light. For this reason, it has been used to demonstrate the relative light-barrier properties of experimental packages (*1*). Losses of riboflavin from products such as enriched brown-and-serve rolls can be directly correlated with the amount of light which the packaging material lets into the package. Riboflavin is best measured by the microbiological assay technique (*9*).

Vitamin A is another vitamin which can be used to measure changes in quality among different packages. This vitamin is quite easily destroyed by heat and excess oxygen. When used to fortify food products such as skim milk and oleomargarine, it becomes very important that the packaging be the best possible to preserve the added amounts. Vitamin A is quite readily destroyed in skim milk when exposed to light and provides a good index of the light-barrier properties of different packages (*2*).

Prevent Vitamin Losses

Measurement of these and certain other vitamins not only provides a useful index of quality change among different packages, but also has some nutritional significance, especially in vitamin-fortified products. **If the package does not protect the product from vitamin losses, it leaves much to be desired since drops in vitamin content frequently precede other visible and more apparent quality changes.** Furthermore, the addition of vitamins to food products is expensive and is money wasted if the product is not properly packaged to retain the added amounts.

Toxicity

Toxicity of the packaging material must be considered, especially in connection with product/package interaction. Normally, the toxicity of any packaging material is checked thoroughly by the manufacturer before recommending the material for use in food packaging. There exists, however, the possibility that reactions could take place between the constituents of certain food products (acids, hydrogen, sulfur, etc.) and the packaging material to cause the formation of toxic compounds.

If there is any doubt that such changes could possibly take place between the product and the packaging material, the manufacturer should ask the supplier of the material for such data available which would answer any doubts, or investigate the situation with animal feeding studies. From the stability characteristics of the packaging material and the food product, it is possible to guess as to the nature of the changes which might

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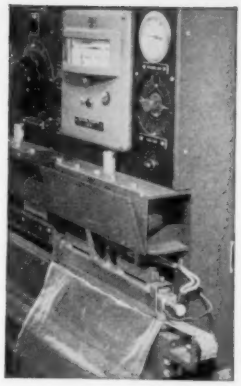

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occur. Evidence that changes are occuring may be had from off-flavors and off-odors although these factors may not necessarily mean the presence of toxic compounds.

It is hoped that this discussion will prove helpful to others in establishing or improving a positive program of food package evaluation.

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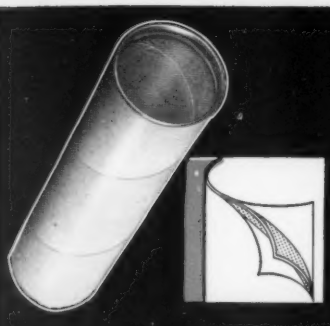

LARDPAK* LINER.
Lardpak liner inside, then fibre, and printed Lardpak paper used outside. A grease barrier for scores of materials. Example of use: caulking compounds.

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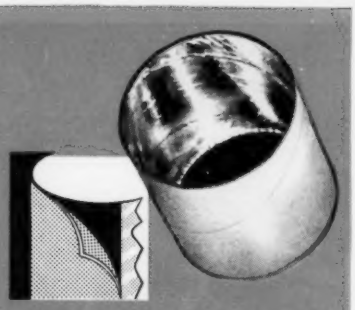
This combination offers the packer both grease and moisture resistance. Example of use: various chemicals.



FOIL LINER.
Foil backed by pitch followed by two layers of fibre laminated with glue. Pitch serves two purposes: As adhesive for foil (2) sealer for pin holes in foil. Example of use: seed innoculants.

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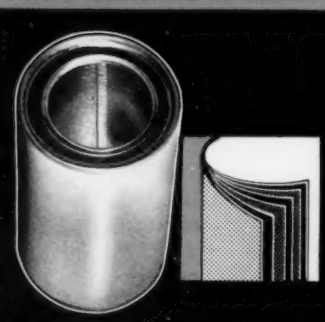

CHIP KB.
Pitch layers between layers of fibre, for moisture resistance. Convolute can shown here. Example of use: wallpaper cleaner, cold water paints.

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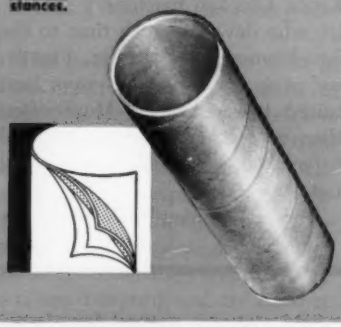

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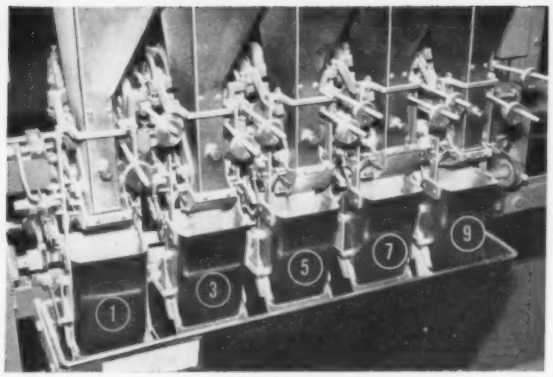
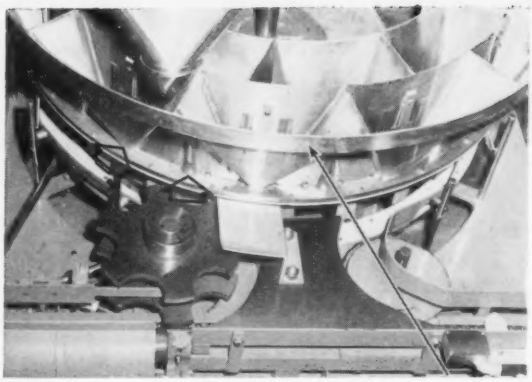


1 Front bank of weighing unit consists of scales numbered as shown. Other bank, with scales numbered 2, 4, 6, 8, 10, backs up to this one. Scales operate in numerical sequence which can be compared to firing order of an engine. While one scale is dropping, others are progressively weighing product preparatory for their next drops.



2 Indexed by star wheel into filling equipment, jars line up under filling heads of rotary turret (long arrow). One-piece turret, 4 ft. in diameter, contains two concentric, circular rows of 12 buckets each, making total of 24 buckets. Note: Although top openings of buckets are staggered, filling spouts (box arrows) are in line with one another.

New approaches to

By Charles H. Kretschmer, Jr.,
President,
Kretschmer Wheat Germ Corporation,
Carrollton, Michigan

The horizontal nature of the packaging field makes it natural for a company making and packaging some product to borrow a technique from some other industry or product and, more often than not, devise new methods, and machinery to handle specific jobs. Frequently, long established packaging line principles lend themselves to a new combination. Describing his company's packaging line, Mr. Kretschmer shows how to coordinate weighing, filling, agitating, checkweighing, and so on – all at production speeds and in minimum space. A machine designed and built by the company is unique in that it uses cellophane tape to apply leaflets to the glass containers, completely automatic at line speed.

By combining some of the methods of liquid and granular product filling, and coordinating a series of standard equipment units, we found a new approach to packaging. Also, using a completely automatic machine which we invented and built, we apply an outfold leaflet to *every* glass container of our Wheat Germ. Thus, in minimum space and at an efficient rate of speed, we now package 12-oz. jars of product.

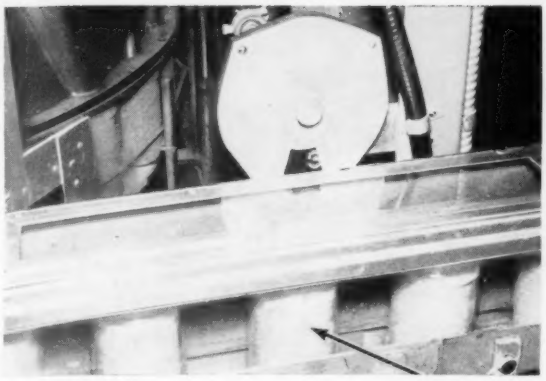
Our specific problem was to achieve trouble-free packaging line operations in a minimum space allotment, and at the same time, gear the line to speeds which we had to maintain. The present U-shaped line wasn't developed overnight. It was the result of trial and error, constant study of the problem, exhaustive research into equipment available – we sought the technical advice of Walter Kruse, Chicago machinery specialist, who devoted much time to the development of our filler. Finally, we came up with the system best suited to our needs. More often than not our plant engineers had to solve many problems in laying out the lines.

The line is completely automatic and requires five operators. One feeds the empty glass; two attend the capper, labeler, and checkweigh filled containers; one attends the oufold-applying machine, the outfold folder, and the filler; and one is responsible for the automatic case packer.

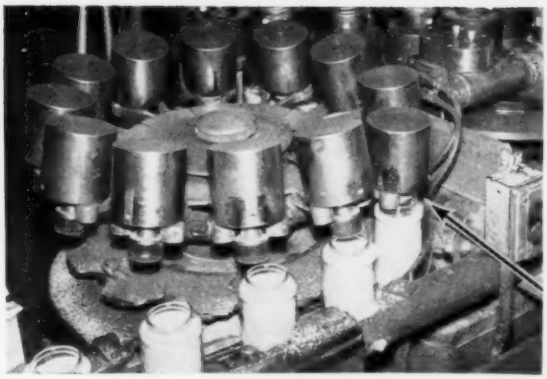
Heat Empty Glass

Dumped upright onto a Standard-Knapp unscrambling table, the empty jars are conveyed between two electric, rod-type heaters each approximately 4 ft. long, which we designed and built. Thermostatically controlled, the heaters condition the glass to room temperature. On extremely warm days, this operation is usually not necessary.

Cover clean containers. Leaving the heater section, the jars are turned upside down by a spiral



3 Operated by direct rigid drive from drive shaft of scales, special dial aids in checkweighing filled jars. As containers pass under dial, dial turns, synchronized with their travel. At moment given jar (arrow) is under window, number showing, "3," is scale which filled jar, although same scale has filled others in meantime. (See Fig. 8.)



4 Head spacing unit, containing weighted plungers which operate on cam at same time unit is turning, assures ample head space in jars prior to capping. Cam is set so that it frees itself of plunger momentarily causing entire dead weight to rest on product (arrow). This flattens out top surface of product, leveling it to give proper head space.

s packaging line efficiency

conveyor, and pass through the air-blasting cleaner of our own make, which discharges them into a second spiral conveyor. At this point, they are righted again, and transferred onto an infeed conveyor like that for a typical rotary liquid filler. Beginning with the latter spiral conveyor, all areas through which the jars pass, until ready for capping, are enclosed with Lucite. Thus, the containers are under cover after being cleaned until just prior to entering the closing machine.

Containers Enter Filler

Obtaining proper interval from a Horix worm feed, the jars leave the infeed conveyor and enter a standard star wheel which indexes them into the Parsons automatic filling and weighing equipment. At this point, they line up under the filling heads of the rotary turret.

The one-piece turret is 4 ft. in diam. and is fabricated so as to form two concentric circular rows of 12 buckets each, making a total of 24 buckets. The two rows make up the outer periphery of the circular turret. Although the rectangular, intake openings (tops) of the buckets are staggered, the buckets are designed and arranged so that their round, bottom openings (the filling spouts) are in line with one another in a circle. Thus, from either row of buckets, product discharges into the same relative position.

Have Ten Scales

The weighing unit consists of ten scales set up in two banks of five each, with the banks arranged back-to-back. The unit is mounted over a pair of large hoppers so that one bank discharges into one hopper, and the second bank into the other. Each hopper is suspended and aligned over a row of buckets in the turret. Thus, the "front" bank of scales feeds product to the front hopper and thence to the outer row of turret buckets; the "back" bank feeds the back hopper and inner row of buckets.

The weighing and discharge functions of the scales compare, in a sense, to the firing of an engine; that is, each scale drops a full charge of product consecutively—all do not drop at the same time! Assume that the front bank of scales is numbered 1, 3, 5, 7, and

About the author:

Charles H. Kretschmer, Jr. attended Notre Dame University and studied business administration. In the food business all his life, he started out in the retail store. In 1937, a separate manufacturing company was formed which was the beginning of the present corporation, of which Mr. Kretschmer is president. He is a member of American Oil Chemists Society and Institute of Food Technologists.

5 Filling/weighing unit with Lucite sanitary covers removed. Note timing chain (safety cover removed) connecting drive for scales to main drive; assures synchronization of scales and turret so that no drop is made until right moment for product to drop into proper bucket.

9, and the back bank, 2, 4, 6, 8, and 10. Each scale weighs and discharges 12 oz. of product in this numerical sequence. **This arrangement permits more drops per scale bucket.**

In other words, No. 1 drops into the front large funnel; then, No. 2 into the back large funnel; next, No. 3 into the front; and so on until all ten have dropped. Then the cycle is repeated. Thus, **while one scale in a bank is dropping, the other four in the bank are progressively weighing product preparatory for their next drops.**

Our rate of packaging requires this many scales with this type of filling arrangement—24 heads in a rotary turret. Normally, each scale makes eleven drops a minute. However, it is possible to get as high as 13 or 14 drops per scale without detracting from the weighing time necessary for weight accuracy. **Because of this one-at-a-time dropping action by the scales, we are able to shorten the space required for discharging product into the rotary turret buckets.**

Proper timing is important to assure that a scale does not dump into the large hopper until just the right moment for its contents to drop into an empty bucket in the continuously rotating turret. This is controlled by a timing chain connecting the common drive shaft for the scales to the main drive of the filling machine.

Ample Time For Agitation

At the moment the star wheel positions an empty container under a filling head, the product, just dumped by one of the scales, starts to discharge into the jar. Simultaneously with filling, agitation takes place. **A major feature of our operation is that each container and its respective filling head travel together during nearly one complete rotation of the turret. This allows ample time for filling the container, and permits the agitation that otherwise would not be available. As a result, the product settles well in the container and does not spill over the top.**

To illustrate this point of "ample time," the 24-head turret makes about 5 r.p.m. Thus it takes about 10 sec. for a given head to complete one revolution. Deducting about 1 sec., for the time when a filled jar is discharged until the next empty one is positioned under the same head, leaves about 9 sec. for the filling and agitation.

Spillage Is Minimized

The agitation is of a *side-to-side* type which minimizes the spilling factor inherent in vertical or elliptical agitation. It is accomplished by a large ring mounted just inside, and slightly above, the round, flat conveyor ring on which the jars rest while being carried around under the filling turret.

Gently tapping the bottom sides of the jars is an eccentric which is operated off the drive shaft which turns the filling mechanism. Since the ring taps the jars on the sides facing the center of the equipment, the jars are pushed outward slightly. Keeping them pushed inward, and in line, is accomplished by long coil springs, of the screen-door type, mounted horizontally under tension.

Special Dial Aids Checkweighing

A special feature of our equipment is the dial which acts as a guide when checkweighing filled containers. It is located just above the discharge conveyor from the filling equipment. Containing numbers from 1 to 10, the dial is mounted in a housing which has a small window like that in a

everything you sell
deserves the protection of

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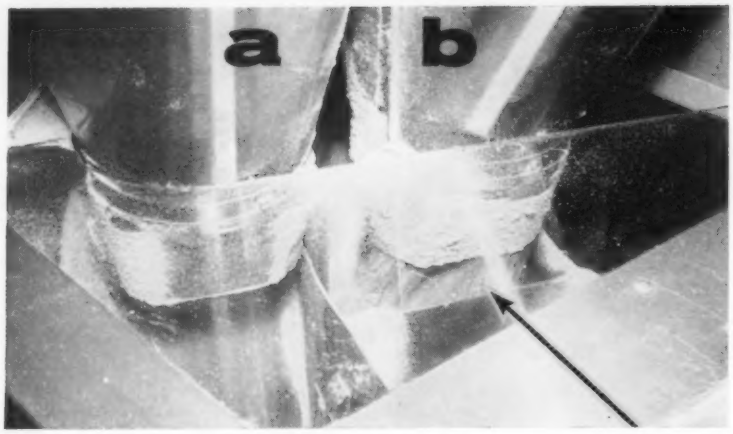


6 Pair of large hoppers mounted directly under banks of scales. Front hopper (a), fed by front bank, discharges into outer row of buckets; back hopper (b), fed by back bank, discharges into inner row. Note product (arrow) dropping from back hopper while no product is coming from front hopper. This is due to product's being discharged from one scale at a time.

camera for indicating the picture being taken.

As the filled jars pass under the dial, the dial turns, synchronized with their movement. At the moment a given jar is under the window, the number showing through the window is that of the scale which filled that container, although the same scale has filled a number of others in the meantime.

The dial is operated by a direct, rigid drive from the drive shaft running the scales. When we installed the direct drive, it was only a matter of setting the dial number to correspond with that of the scale which was dropping, and locking the bevel gears connecting the drive shaft for the dial. **Under normal operation, there is no chance for the dial to get out of synchronization.**

Since the rotary turret contains 24 filling heads which receive product from only 10 scales, **each scale dumps product into a different head each time it makes a drop.** Thus, without the dial, it would be very difficult for the operator to know which scale filled which jar. **We find this means of matching up the scale with the container it filled, extremely useful in calibrating and checking weights.**

In use, the operator removes a jar from under the dial, noting the number appearing in the window. After checking the weight, she may or may not want to adjust the scale, but if necessary to do so, **she knows without hesitation which scale to change.** Normally, we make these checks on a spot-check basis which gives us satisfactory control.

Glass Transfers To Capper

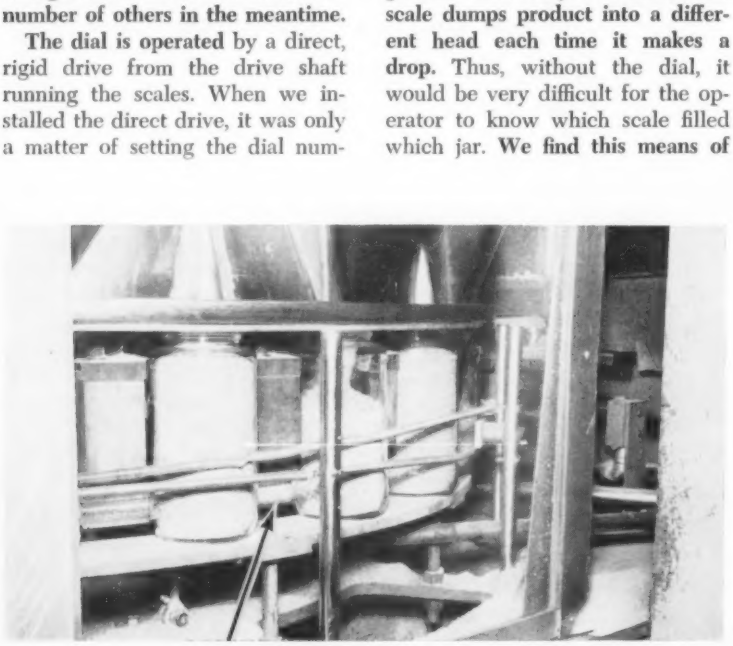
After filling, the jars are discharged from the filling equipment and are conveyed to an Anchor-Hocking rotary vacuum closing unit. Although agitation during filling causes the product to settle in the jars and avoids runovers, there may not always be quite enough headspace to allow a spill-proof operation when vacuum-capping.

To assure ample headspace, prior to entering the closing machine, the jars pass under a rotating headspacing unit which contains weighted plungers. Operating on a cam at the same time the unit is turning, the plungers slowly move downward into the jar openings. **The cam is designed so that it frees itself of the plungers momentarily, causing the entire dead weight to rest on the product. This flattens out the top surface of the product, thus leveling it to give proper headspace for capping.**

From the closing equipment, the jars travel on to a roll-through Chisholm Ryder labeler. This is a conventional operation. After labeling, the outfolds are applied.

Tapes Brochures To Glass Automatically

Realizing that there wasn't enough space on our label to give our customers all the additional information, recipes, etc., about our product, which we would like to, we decided that a small brochure in the form of an outfold was the answer. Taping this outfold to the jar was the most satisfactory means



7 Side-to-side type agitation, minimizing spilling, is accomplished by large ring (arrow) concentric to, and inside of, platform on which jars ride. An eccentric, and operated by drive shaft which turns filling mechanism, it gently taps bottom sides of jars causing them to be pushed outward slightly. Long, screen-door-type coil springs keep jars pushed inward.

of getting it out to the consumer.

We felt that to produce only a small quantity, as one might do purely for a promotion, was not sufficient. We wanted every jar to have an outfold. Investigation of hand methods showed their cost to be prohibitive, and we could find no equipment to do the job automatically which was necessary if we were to use the outfolds at all. With the problem facing us, we were determined that we would build our own machine.

Build Own Applicating Machine

With a basic design idea in mind, we started out. After many trials, changes, and so on, we came up with the patented machine we are using today. **It is completely automatic, operates smoothly, and runs efficiently at the maximum speed of our line.**

Jars roll into place. Gaining their momentum as they are discharged from the labeler, the jars *roll* into the outfold machine which is located in the line after the labeling equipment. Rolling along the table portion of this machine, the containers first contact a pair of powered continuous belts traveling rapidly in the horizontal plane.

Mounted on either side of, and perpendicular to, the flat table portion of the machine, the belts are spaced so as to provide enough pressure to hold the jar by its top and bottom, and stop its rolling motion. While the jar is being held immobile, but being carried forward by the belts, the outfold is applied using cellophane pressure-sensitive tape ⅜ in. wide.

Spots Outfold

We are able to actually spot the outfold at a certain point on the circumference of the jar by locating the outfold machine properly. This is best explained by the fact that the glass always leaves the labeler with a given panel of the label facing in the same relative direction.

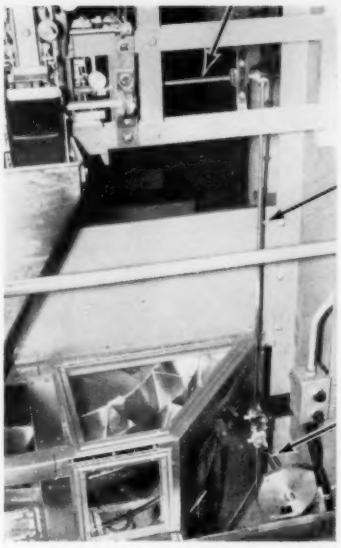
By adjusting the distance between the point of discharge from the labeler and the point at which the rolling jars are "grabbed" and held immobile by the continuous belts, that portion of the label to which we attach the outfold always points upward. In other words, the distance is adjusted so that each jar makes the same number of revolutions between the two points of contact.

We will now assume that an outfold is in proper position, stuck to a portion of tape led from the tape feed roll, and that the free end of the tape is pointed downward in the path of the oncoming jar. As the jar is moved forward by the continuous belts, the free end of the tape catches near the bottom edge of the label, and the forward motion of the jar pulls on the tape until it is cut off. This pull unwinds the right length of tape (about 2 in.) to hold the outfold on the jar.

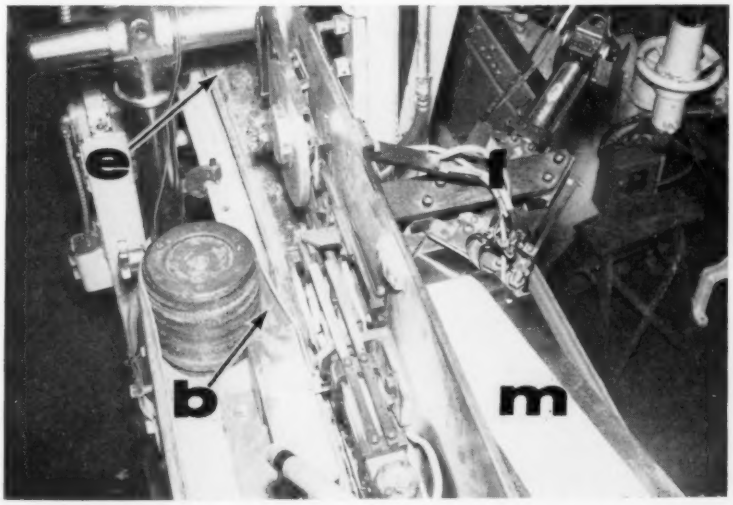
At the right moment, as the jar is carried forward, a serrated knife edge cuts off the tape. Immediately, a spring-actuated roller (positive position: downward against the glass), riding over the tape on the jar, is free to roll the cut end of tape downward onto the label, completing the operation.

Machine Folds Brochures

Our outfolds measure 11½x4⅞ in. in the flat, and are folded four times to produce a size 4⅞x1 in. Folding is done on a conventional Dexter folder which is mounted, to conserve space, over the discharge conveyor leading from the outfold-applying machine to the case packer. Discharged from the folder, the outfolds line up on their edges in the outfold-applying ma-



8 Location of special dial (right foreground) in relation to turret and scales. Note direct drive (arrows) from dial to scales, maintaining synchronization. (See Fig. 3.)



9 Top view of automatic tape applicating machine. Jars roll from labeler, entering machine at a point "e," until they contact pair of continuous belts (b). Rolling motion is stopped by belts, but belts carry jars forward while outfold is applied. Magazine (m) feeds outfolds to mechanism (f) which positions them for application. (See also Figs. 10, 11, and 12.)

U.S.I. POLYETHYLENE NEWS

A series for plastics and packaging executives by the makers of PETROTHENE® polyethylene resins

JULY, 1959 — U.S. Industrial Chemicals Co., Division of National Distillers and Chemical Corporation — 99 Park Ave., N. Y. 16, N. Y.

Packaging Notes

New research study on packaging has been issued by the American Management Association in book form. The book offers a comprehensive inventory of literature on packaging research. Current trends in packaging research, materials and methods are described. The book also lists principal sources of packaging information, such as periodicals, directories and manuals. The study includes a survey of packaging research needs and the special requirements of particular industry groups. The book is available for $6.00 from the AMA., 1515 Broadway, New York 36, N. Y.

Polyethylene bags for heavy transformers are saving an electrical equipment manufacturer $33,000 annually in packaging material costs. The company is shipping transformers ranging in weight from 300 to 1800 pounds in gusseted, 4-mil polyethylene tubing bags.

The transformers are readied for shipment by mounting them on prefabricated wooden skids, placing pieces of single-wall corrugated over the tops to protect the finish. The polyethylene bags are then placed over the transformers.

Previously, the company shipped its transformers in heavy paper covers and wooden crates. The new bags have resulted in substantial savings in labor costs and shipping weight. Hidden damage during shipment has also been reduced.

New machine does four color printing on plastic bottles. The machine accommodates one to four colors, does its printing by offset. The machine operates without mandrels, uses compressed air to print the plastic bottles. The unit employs two large conveyors and twin chains holding 14 bottles on slides.

Expanding carton with polyethylene liner is being tested by the Army as a means of serving hot rations to troops in the field. The carton, which holds dehydrated rations, has uncut, pleated top flaps which increase the carton's volume by a third when open. A polyethylene liner is unfolded and placed in the carton, hot water is poured into the liner and the dehydrated rations are placed in the liner and reconstituted. The increased size of the opened carton easily holds the extra volume of the reconstituted rations. The liner and carton form a leakproof mixing and serving container.

The new carton is expected to have civilian retail applications for powdered food products requiring the addition of liquid. These might include such mix-and-serve products as fruit drinks, milk, cocoa, gelatin desserts, pudding, hot cereals and instant coffee.

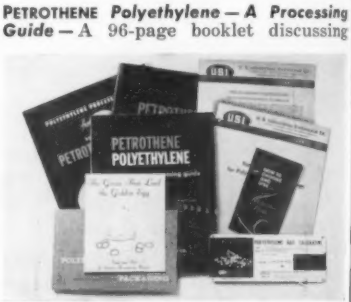
U.S.I. Offers New Literature For Polyethylene Processors, Packagers

Data on Film, Pipe, Molded Housewares, New Commercial Standards

Valuable information on polyethylene processing and packaging is now available from U.S.I. in the form of free booklets, processing tips and reference data. The information is based upon U.S.I.'s extensive polyethylene research conducted at the company's Polymer Research Laboratory in Tuscola, Ill. and from industry-wide marketing and packaging studies.

Among the literature offered is:

PETROTHENE ***Polyethylene — A Processing Guide*** — A 96-page booklet discussing technique for processing polyethylene, processing problems, and polyethylene properties.



Formulas and Tables for Polyethylene Film and Bags for determining such factors as feet of film of various gauges from a given quantity of resin; weight per 1,000 feet of film, or number of bags of a given size that can be made from a quantity of polyethylene film. The tables are particularly useful to film extruders and those who make or use polyethylene film bags.

Slide rules with the same type information are also available.

Which Polyethylene Film Should I Use, which relates to the new Recommended Commercial Standard for Polyethylene Film (TS-5438) and indexes the various types and gauges of polyethylene film recommended for different packaging jobs. The corresponding PETROTHENE resins for each type film are also listed for easy reference by extruders.

Other literature offered includes a booklet on polyethylene pipe standards, "How to Choose and Use Polyethylene Plastic Pipe," "The Goose That Laid The Golden Egg," U.S.I.'s famous guide for buying polyethylene housewares; a complete collection of the well-known "Processing Tips" which U.S.I. has published regularly in leading plastics publications; and the booklet "Polyethylene Creates New Opportunities in Packaging."

To order any of this material, write to Editor, U.S.I. Polyethylene News, U. S. Industrial Chemicals Co., 99 Park Avenue, New York 16, N. Y.

Poly-Coated Pipe Resists Underground Corrosion

The first steel pipe in the industry to be coated with an extruded plastic is finding widespread use by gas, oil and chemical companies with underground pipeline installations.

The pipe is factory coated with extruded polyethylene applied over an elastic adhesive undercoating. The coating has high insulation resistance and dielectric strength. This is especially important in underground pipelines where stray ground currents are a troublesome cause of pipe corrosion. The plastic coating is so tough and resilient that rocks can be bounced off the pipe without piercing the coating. The pipe can be bent in the field without damage to the coating.

Polyethylene Film "Bubble" Speeds Construction Work

A "warm air bubble" of polyethylene film inflated over excavation site thaws the area sufficiently for concrete to be poured even in subfreezing winter weather.

This novel application of polyethylene film has been used successfully by several construction companies. In one operation a 50 x 64 foot sheet of film was anchored to the ground with cement building blocks and inflated with warm air from the blower of a temporary furnace. About two pounds per square inch pressure was used. Concrete was then poured in temperatures that ranged down to zero. The bubble was left up for three days to give the concrete time to cure without freezing.

New U.S.I. Plant Reaches Full Output In 6 Weeks

U.S.I.'s new 75 million pound polyethylene plant at Houston, Texas, reached capacity production just six weeks after going on stream.

Production reports show that quality of the material produced is high. A sizeable proportion of the output to date has been film grade and coating resins. Plans are already underway to double the capacity of the Houston plant by the third quarter of 1960.

chine's magazine which resembles a flat trough. This magazine is positioned at a slight incline over the outfold machine and supplies the mechanism which feeds a single outfold to the application station.

The discharge end of the magazine curves sharply downward so that an outfold is lying almost flat when pushed into the taping position. This latter operation is performed by an air-operated plunger mounted at a prescribed angle to the curved end of the magazine. At the moment the tape is cut after applying an outfold, the plunger positions another outfold preparatory for the next jar. **The entire machine is completely automatic.**

Remember that the containers are feeding into the machine at a fast rate of speed. Therefore, perfect timing of all of the machine's functions is imperative. Once the various Micro Switches, levers, air cylinders, etc., are synchronized, little attention, other than changing the tape roll (we use a 6-in. O.D. roll), is required of the operator, who also attends the folder and filler.

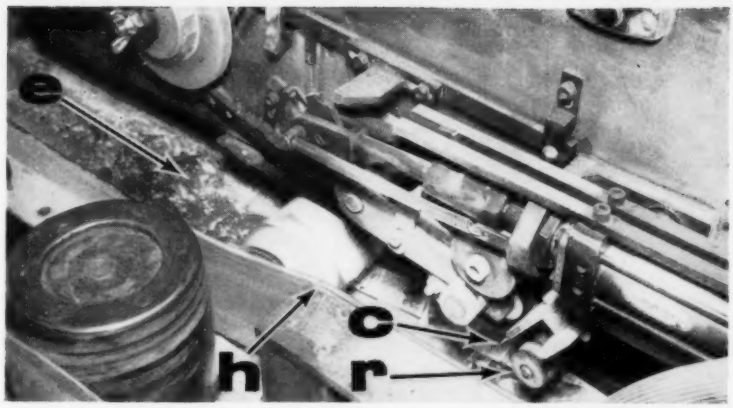
With their outfolds taped firmly in place, the containers are once again righted ready for casing. This final operation is performed automatically by a conventional Standard-Knapp case packer.

Final Check Of Product

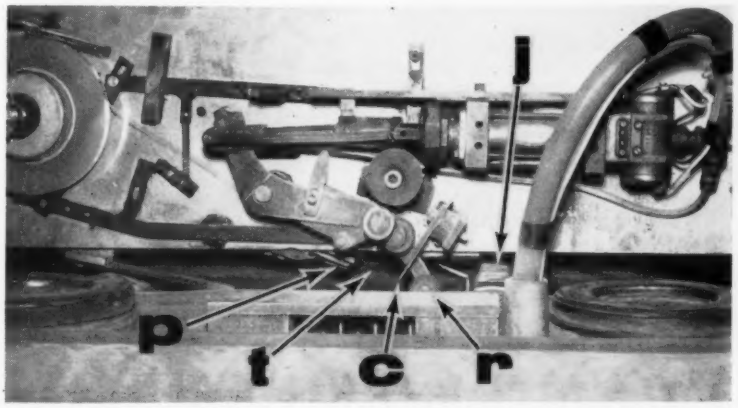
We do not glue all cases immediately. We merely close the flaps at this point. Prior to gluing, our product stands in storage for two days, after which time the vacuum in the containers is checked.

Checking is done by tapping the caps lightly. From the resulting tone, we can determine, within 1 to 2 in., plus or minus, the amount of vacuum present inside.

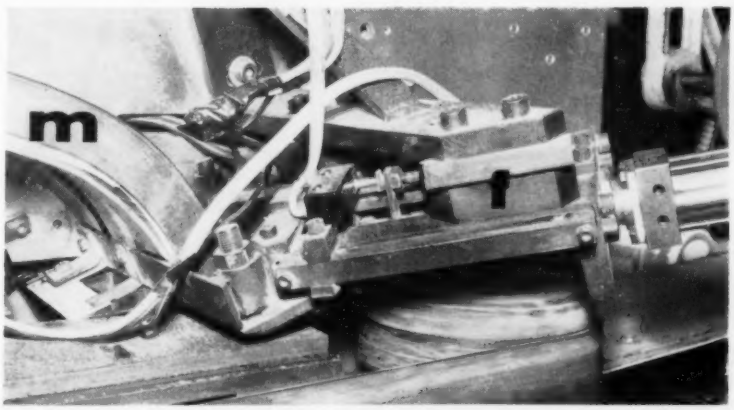
Our reason for doing this is due to our finding that minor slow leaks cannot be detected efficiently without the storage-time interval. This rechecking procedure assures us that each container leaving the plant is properly sealed, assuring preservation of the product until opened by the consumer. *(End)*



10 Mechanism which applies outfolds. Note fast-rolling jar approaching continuous belts. At point "h," belts stop rolling motion, but carry jar forward while jar picks up leading end of tape and unwinds proper length. Knife (c) cuts off tape, and free after-end of tape is pressed down by roller (r) finishing taping operation. (See also Figs. 9, 11, and 12.)



11 Closeup of mechanism which applies outfolds to jars. Note jar (j) has just finished having outfold applied. As next jar rolls toward applicating position (p), outfold is fed to this point and tape (t) is tacked to outfold. Jar picks up tape immediately, and taping operation commences. (See also Figs. 9, 10, and 12.)



12 Mechanism (f) which feeds a single outfold to applicating position. Discharge end of magazine (m) curves sharply downward so that outfold is lying almost flat when pushed into taping position. Note single outfold (at left, under magazine) ready to be pushed into position for taping. (See also Figs. 9, 10, and 11.)

Circle No. 233 on Card, Page 66

Four steps to effective packaging research

- ***Applying the technique of compromise***
- ***Tracing a pattern for development***
- ***Providing the tools to make it work***
- ***Maintaining direction and follow-through***

By Charles W. Kaufman,
Director,
Research and Development Division,
National Dairy Products Corporation,
Glenview, Illinois

With all of today's talk about "the organization man" we hear many people saying you simply can't keep a tight rein on research and development. If you do, they tell us, you are stifling your creative people and running the risk of not getting the contributions they can make. Others tell us that research far too often gets out of hand. Just what is the best course to follow?

There is a workable middle ground. Our experience convinces us that you can stimulate the best efforts of your creative and scientific people, and still have adequate control of their activities. While you can't measure intangibles with a checklist, there are basic guideposts to the management of research and development.

Applying these principles to specific areas of packaging research and development, we urge attention to four key points. Using these (with due regard for their accompanying implications) should prove helpful. These are:

1. The technique of compromise.
2. Outlining a pattern for development.
3. Providing the tools to make the pattern work.
4. Having adequate direction and follow-through.

Before looking at these in detail, we might stress two cardinal points: (1) **You cannot overestimate the value of compromise** as an effective tool in coordinating packaging research and development. (2) **Those responsible for managing these efforts should never lose sight of three key words** underlying effective management of such activities: **Guide, counsel** and **suggest.**

Turning now to our four steps, we see that the first two apply primarily to those on the firing line, the individuals actually doing the development work. The second two pertain primarily to the managerial effort backing up those responsible for the first two areas. All four relate closely.

Adequate management of packaging research requires its manager to walk a tightrope between freedom of creativity and control of activity. Asked what it takes to get a balance between these extremes, Mr. Kaufman offers four helpful guideposts. His observations on (1) the importance of making compromises, (2) the need of providing a definite pattern for research, (3) giving researchers tools for the job, and (4) having sufficient control, deserve the thoughtful attention of anyone concerned with directing packaging research. His emphasis on a "guide, counsel and suggest" approach answers the query of those wondering how to stimulate creativity without letting it get out of hand.

APPLYING THE TECHNIQUE OF COMPROMISE

The different departments and individuals seeking a suitable package have such varying requirements and represent such divergent viewpoints that getting a package meeting each requirement of all these people is impossible. In order to get an economically feasible package we have to sort out the important from the less important.

Obviously some factors are fundamental. There can be no compromise with product protection. You just can't do without certain structural and functional performance features. If you did, you simply would have no package.

This is important to remember because the area for compromising usually shows up after the basic requirements become clear. **Normal procedure is that the first approach is to determine what a particular product needs.** Once we do this (I say "we", meaning chiefly the people who do the packaging research and development), our next step is to work with the sales and marketing people.

Review Of Alternatives

Sometimes it is the other way around. They may regard certain features as absolutely necessary in order to have a competitively salable packaged product. However, in the absence of some overriding marketing requirement for a pack-

age feature, we come up with one, several or many possibilities.

Usually the compromising starts when we show our initial packages to the sales and marketing specialists. Often countless meetings are necessary while the technical packaging and the merchandising people trade views.

A major point is that however much experimentation and compromising takes place, it all goes on within the confines of the protection pattern of the product. Suppose for example, we are seeking a package for some kind of sauce. Our people might review several alternatives. Suppose the consensus is that a pouch represents probably the best package for this item. Our packaging people might review the alternatives to a single pouch, as well as different forms of the pouch itself. Perhaps a combination of two saddle bags might do, or there might be justification for a roll-down pouch.

Whatever the product and the choice of packages for it, the packaging people work back and forth with the sales and marketing specialists in order to get a package that satisfies all parties concerned at this stage. Once they agree, their attention next turns to another big area for compromising! Having selected the package they all want, their next question is **how much does it cost?**

Cutting Package Cost

Whether a product is new or existing, and no matter what it is, there usually is a certain price range in which it can sell. The sales and marketing people normally know within close limits just what cost a particular package should not exceed. The technique of compromising now focuses on **how to get the essential protection plus the desired merchandising features without exceeding the cost limit.**

As an example, one approach might be to reduce shelf life. Our packaging specialists may have developed a package having a one-year shelf life. But it costs too much for the marketing people, who (in the course of much discussion) may conclude that cutting the shelf life from one year to six months will in no way jeopardize the product in the market place or in the hands of consumers—but at the same time will bring packaging costs to workable levels. A less costly material may be the answer in doing this. What the marketers may really want is a cheaper material in order to have just as much space for display or copy on the package surface. A costlier material might indicate a package dimension cut.

Another approach may be simply cutting the amount of material in a package. This taxes the ingenuity of our specialists, but this is why we have them. And whether it takes days, weeks or months, a compromise package eventually appears. But the end is not yet! Next phase of our job is taking it up with the engineering and production specialists who must turn out the packaged product in volume at our plants.

Can Our Lines Run It?

This is another area for compromising. The package that satisfies everyone thus far may be one that

Charles W. Kaufman is a graduate of Washington & Lee University with a B.S. degree in chemical engineering, and has taken graduate work at other universities. Prior to his present position, he was vice president and a director of Kraft Foods Company, assistant director and director of research of General Foods Corporation. Earlier he was with National Canners Association and National Fruit Products Corporation. Mr. Kaufman has served as consultant to the Quartermaster General's office and as an officer and adviser in the Research and Development Association, QM Food and Container Institute. He is a member of Institute of Food Technologists, The Refrigeration Research Foundation, and Packaging Institute, of which he is currently president.

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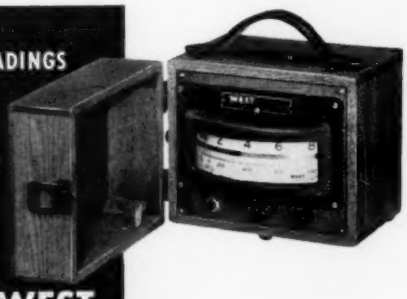

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will not handle on machinery now in our factories. There may be no existing machine on the market that will form, fill and seal this package. Or it may call for equipment too expensive or too slow for our normal operations. Many compromises become possible—and necessary. For example, sales and marketing people may want a container of unique shape. Adopting it might call for equipment not in any of our plants. The compromise here may mean getting the sales and marketing people to fit their product into a bottle handled on existing equipment, or developing a compromise container. **The overriding factor in this case would be the capital investment in equipment already on hand.**

To a certain extent the technique of compromising is cumulative. As a package progresses from discussion to production, each time some change appears desirable it may become necessary to look at the other factors all over again. But above all, our packaging people never compromise the essential requirements of protection. From this point on, however, the technique of compromise is the *essence* of package development.

OUTLINING A PATTERN FOR DEVELOPMENT

Assuming thus that compromise is all important to package development, we might look now at development of a pattern or framework within which compromising can take place. For illustration let's consider a brand new product. This directs attention to our basic philosophy of laboratory organization. **We feel two types or phases of organization are necessary. First, there is the organization built around product specialists. Second, there is a supporting organization furnishing a variety of services to the product specialists.** The service groups may include chemists, engineers, packaging specialists, package engineering groups and the like. The point is there are distinct areas of specialization.

Pinpoint Requirements

Suppose our company wants a certain new product. Its development is assigned to the product laboratory and in particular to those specializing in that kind or category of product. So our laboratory people develop a formula. As soon as they have a reasonable idea of the product and can spell out something approaching a basic formulation, the information goes to the packaging people. Here also we have specialization, and the assignment goes to the packaging specialists concentrating on that particular class of product. Thus the assignment goes to the people in packaging most likely to be "at home" with it.

At this point requirements become extremely specific. They include details such as shelf life, oxygen transmission, oxygen content, freedom from caking, vulnerability to reflected light in a supermarket—and so on. The list could be endless. In other words, the product specialist hands this collection of characteristics and requirements to the packaging specialist who in turn must put a "wrapper" around it.

Group Leader: Key Man

Our reliance on specialization by areas of activity also stresses the importance of the group leader. He is the key individual in the discussion and compromising process. When he gets the product requirements (whether highly specific or in broad generalities) from the product specialist, he must explore the packaging possibilities. However, since the product falls in his area of experience and activity, he usually has some basis on which to start.

While this is going on, he may also be in contact with the marketing people. Sometimes marketing experts have definite requirements for a package for a product of this sort, and at other times they offer no initial suggestion or preference. They are open minded where they can be but at other times, offer very specific requirements predicated on

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their knowledge of marketing that product.

While there is a definite pattern in handling these projects, the situation is far from uniform. Almost every case is different. Sometimes there may be as many as 100 models of a different package. Product, packaging and marketing people may exchange views. Sometimes they get into highly technical areas. Often they work out a compromise functionally. Suppose, for example, it is a question of making a closure easy to open. The parties may agree on a silicone lubricant to facilitate cap opening. Some may feel a shoulder on the package is necessary, and others in the discussion object on the grounds that it makes the package vulnerable to breakage. **The sharing of views helps interested parties reduce their differences to a common denominator on which they all agree.**

Way To Solve Problems

The process of evolving just the right package boils down to **all parties taking a sensible approach to the best way** to resolve a particular problem. Sometimes the sales and marketing people insist on a package having certain features. Because of importance of these features to marketability of a product, they predominate. In other situations, the way is to start with the protection necessary, stress the functional aspects of the package and build from there.

Aside from his technical competence, a basic skill of the group leader is being able to sit down with people, hear others' views, discuss different possibilities, and work towards effective compromises.

Another significant feature is that in this compromising process, qualified people from one area are talking to those of corresponding competence in another. For example, development of a product normally is in the hands of one specializing in, or at least familiar with, that sort of product. Its packaging is assigned to those concentrating on that class of products. The product and packaging people

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work with a product manager in the marketing area who himself is a specialist—working with that particular type of product. As a result, each one is on familiar ground in his own sphere and is talking with others similarly situated. **All this inspires an atmosphere of mutual confidence and respect conducive to workable compromising.**

PROVIDING THE TOOLS TO MAKE IT WORK

Having shown the job of the development specialists, next consideration goes to the work and responsibilities of those guiding the specialists' activity. **Basic keystones** of packaging research management include these: **(1) Giving a man a job with a cleancut assignment and responsibility, (2) making him understand the responsibility and activity are his, and (3) making sure he knows he has management backing him up, giving him all he needs to accomplish his job.**

This key individual recognizes that certain principles, both technical and managerial, govern his work. Since he knows the management group is supporting him, he realizes that if he needs equipment, facilities, additional help, more time or something else to accomplish his assignment, they will be forthcoming.

Three-Pronged Approach

In other words, his approach has this frame of mind: He knows (1) his business, (2) that he has a specific job to do, and (3) that he will not compromise his own basic area of responsibility. Regardless of where else compromising is possible or desirable, **he does not compromise product protection or key elements of package structural and functional requirements.**

A management responsibility is to put people in the key position of group leadership who are by nature and training capable of sitting down with other individuals from sales, marketing, engineering or elsewhere (in or out of the company—such as packaging suppliers) and approaching discussion with an open mind.

A group leader must have an inherent understanding of the problems of "the other fellow," and he must have or develop the ability to discuss the approach to these problems in terms of other people's backgrounds and special problems as well as his own. There is a broad area of understanding involved here, and a group leader must be able to appreciate the viewpoints of others.

Assuming he has the requisite technical competence (without this he could not do his job), the group leader must have the correct personality for his work. **We cannot stress too strongly that group leaders must be capable of getting along with other people.** Further, a group leader must be able to go outside the company and represent not only our research organization as such, but also our company itself, and be able to carry on negotiations with outside groups, e.g., package manufacturers.

PROVIDING DIRECTION AND FOLLOW-THROUGH

Since so often "direction" and "management" carry authoritative connotations, it is worth stressing that **three key words pervade the work of managing the research function: These are guide, counsel and suggest.** With their accompanying implications they summarize the best approach to research and development management. Speaking personally merely for illustration, my job is to keep out of operations, but to see how things are going and to make sure that adequate progress is taking place. The real job of a manager is to find good people, give them their jobs to do, be sure they understand what is wanted, and then let them go ahead and do them.

At the same time, without in any way limiting creativity, certain controls are necessary. Certain follow-up is vital in order to maintain a moving organization. Several effective tools appear worth recommending.

For example, the laboratory func-

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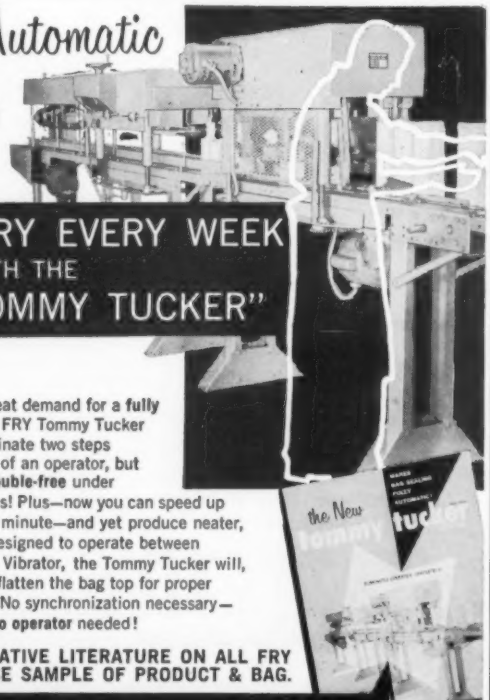

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tion represents the bulk of the work of our research and development division. The laboratory has a manager and assistant manager, and the research responsibilities are divided between them. They must see that these responsibilities are prosecuted and that targets are met.

Report At Meetings

A method of assuring this is to have weekly staff meetings. These are reporting sessions and are definitely not problem-solving meetings. Every Monday morning at 9 a.m. our section managers and associate managers meet with the laboratory manager and assistant manager. Each one reports major activities of his area for the preceding week.

To operate by this sort of management method, **it is absolutely necessary to examine the reports of these meetings.** If your meetings are held Monday morning, the minutes of the meeting should be on your desk the next morning. Our practice is to have these reports reach us wherever we are. If out of town, they are forwarded.

A good practice for one who is away all week is to have the reports sent to his home so he can study them over the weekend and be familiar with their content when he returns to his office Monday morning. Anyone seeking to manage the research and development function cannot overlook giving adequate attention to these reports. **They are important because among other things they show where the trouble spots are.**

The Vital Follow-Through

But hand in hand with a good reporting system, is a bring-up file to serve as a check on reports. My own preference in maintaining a bring-up file is to get a copy of everything sent out from our division, whether a report, letter or any other document. Screening these copies is important. We may throw out as many as 90 per cent of them, but for the other 10 per cent, we assign a bring-up date to each one.

In this connection it is very important to choose a realistic bring-up date, such as 30, 60 or 90 days. It is a waste of effort to aim at impractical bring-up dates, such as a week, ten days, two weeks or something like that.

Doing this is a non-delegable feature of any research and development manager's job, something he must do himself. Our practice is to put dates on these bring-up items showing just when we want to hear about them. Then, if information does not show up automatically in a report or in the minutes of a reporting meeting, a reminder of it comes up in our bring-up file; and we can send a query to the appropriate individual.

Right Span Of Control

Taking another use of the term "reporting," we might look at the practice of reporting for peak effectiveness in management of research and development. In our own organization just five people report directly to the director. These include laboratory and division research managers. In addition, through the research and development divisional organization we have liaison with the major product divisions of our corporation.

The important thing is to hold down to a workable number the individuals directly reporting to a manager. However elemental this may seem from the viewpoint of organization and management, the fact is that organizations are prone to overlook the doctrine of span of control and let it get out of hand.

Having this sort of organization with adequate reporting and bring-up, frees a manager for a major feature of his job: Helping to convince key management people that certain things should be done. For example, a director of research and development may sit on his company's new product committee. There he can meet with top management representatives of the corporation and its major product divisions.

(*Continued on Page 80*)

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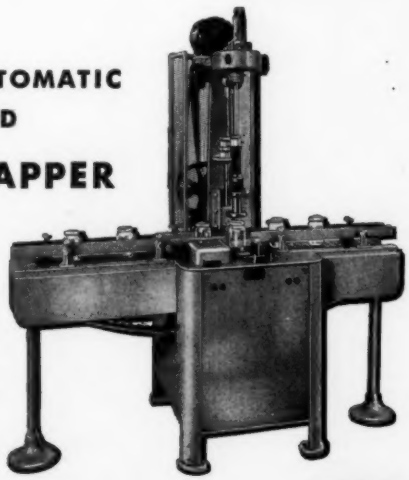

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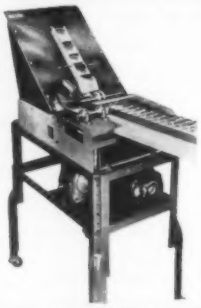

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Structural package design for production, shipping, distribution

By Charles O. Kendall,
Manager of Product Planning,
Becton, Dickinson and Company,
Rutherford, New Jersey

Creation of a successful package for any product must consider and provide all the functions that package will have to perform for the manufacturer, the product itself, and the end user of that product. We place great emphasis on coordination of product design and development, and design of the package for the product.

All of our planning and evaluation recognizes that a product has no existence other than the form in which it will be distributed to the point of end use: This is its packaged form.

COORDINATION VITAL

Such a broad approach to packaging becomes particularly necessary in producing the surgical, medical, and laboratory products which make up a major portion of our business. Problems of sterility protection, ease in handling the product in emergency situations, and preventing error in clasifying and dispensing specialty products, are inherent in all phases of product and package engineering.

A packaging engineer who is denied such coordination often despairs because elements of the product design not essential to end-use frequently present serious packaging dilemmas which could have been avoided by mutual review prior to finalization of design. Similarly, a package designed without the fullest knowledge of the factors which influence the design of the product can impair successful acceptance of the product.

Packaging is a confusing term in that its meaning depends on the type of work in which an individual

In developing the right package for a given product, attention must be given to the role that package will play for the manufacturer, the product itself, and the ultimate consumer of the product. Emphasizing the importance of coordinating package/product design and development, Mr. Kendall points out that some measure of compromise between the packaging engineer, the artist, and sales people must be made. Using examples, he explains how his company kept this fact in mind when it first experimented in the use of a new type of protective partitioning for its surgical, medical and laboratory products.

is involved. The engineer thinks of "packaging" in terms of the equipment necessary to produce the package or to assemble the product in its package. The artist thinks "packaging" consists of the surface package design. The merchandising director thinks "packaging" is the selection and creation of point-of-sale impulse. This individual thinking is true of other phases of packaging.

Separating Of Functions

Our sales department simply endeavors to define (1) what a projected product and package are *to do*, (2) how and where they will be *distributed*, and (3) where and by whom they will be *used*. It does not attempt to design the product or package in any way—except advancing suggestions as to the finished entity needed.

Further, sales testing is kept *entirely separate* from product field testing. **Product and package are tested in selected areas by the product development department, not by the sales force. Prototypes and pilot quantities are prepared and taken into the field for actual use.**

No package can be built without some measure of compromise between packaging engineer, artist, and sales department. This fact was uppermost in our minds several years ago when we made our first experiment in the use of a new type of protective partitioning which has since been applied to a number of our products.

HOW IT WORKS: BLOOD DONOR SET

The product upon which this initial changeover was tried and proved was a blood donor set. This is a low-cost, disposable set, consisting of two needles and a flexible tube 22 in. long. The needle destined to admit the donated blood into its receptacle, is attached to a molded plastic flange 34 in. in diam. At the other end of the tube is a flangeless needle to be inserted into the donor's vein. Both needles are protected by polyvinyl sheaths.

Charles O. Kendall, presently manager of product planning at Becton, Dickinson and Company, was formerly director of product planning for E. R. Squibb & Sons, and director of package development and printing for Colgate-Palmolive Peet Company. He is a past president of the Packaging Institute.

Old Package

In the past, protection and separation of these relatively fragile sets was accomplished by the use of individual, rectangular, folding boxes. These were overwrapped in cellophane as an added precaution in maintaining sterility during storage and shipping.

Cost high. The cost involved in the individual insertion of each product, the purchase and applied design of the box itself, and the outer wrap, (plus the folding boxes necessary to package in quantity) was high. Man-hours of labor required to perform the packaging were also above average.

Unpackaging: A Problem

Moreover, the end user had to undo all of this packaging for access to the product. This often produced attendant risk of damage to the set. For example, some users were found to employ surgical knives to slit the carton and cellophane wrapper. Frequently, this nicked the tubing, causing a "leaker" undiscernable until the flow of donor's blood failed to appear.

Risk kinking the tube. In such circumstances, the entire operation, including a new vein-puncture, had to be repeated. There was also an ever-present risk of kinking the tubing during removal of the set from its box, which would cause uneven or impeded flow of blood from the donor.

Knowledge of these conditions led to a search for a new method of protecting and packaging the sets. We held extensive conferences with the director of process en-

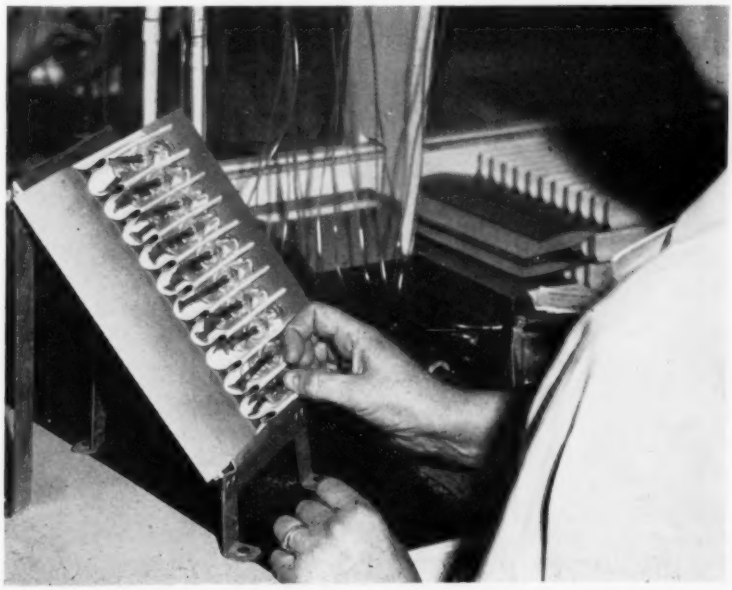

Fig. 1. Packaging line tests show that low-cost, disposable blood donor set can be coiled and readily hand-inserted into special tray containing fluted partitions. Having spring-clip action, compartments were designed so that their diameters correspond exactly to the ¾ in. diam. of the molded plastic flange attached.

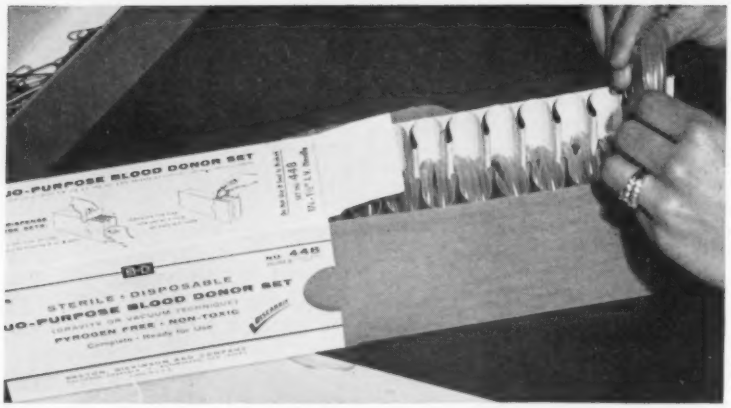

Fig. 2. Large size blood donor set is inserted into U-folded compartment tray. Constructed by affixing two fluted partition strips parallel to one another at either edge of backing strip. Entire tray unit folds into U-shape so that compartments stand vertically facing each other. With last set inserted into compartment, tray is pushed into carton, finishing package.

gineering, the person in charge of packaging specifications, the staff designer, and a packaging design consultant.

Trays With Partitions

The method which was chosen, after examining cost factors, necessary changes in product engineering, and package design, was the use of a partition manufactured under patent by Rondo of America, Inc. This partition, as jointly designed for this application by its producer and our company, is a tray consisting of special boxboard, fluted to form compartments, and glued to a flat bottom strip of the same material.

The bottom strip protrudes 3¼ in. on either side of the fluted partitions which are 5⅜ in. long. The protrusions are scored so as to fold and butt together, forming a self-enclosed, multiple-unit package. It was decided that ten sets were to be packaged together in this manner.

Production line tests showed that the sets could be coiled and readily hand-inserted into the open tops of the compartments each of which has a spring-clip action. This action serves to immobilize the inserted product, thus preventing movement of the whole product or any of its parts in any direction, as well as providing complete separation. Partitions were designed so that their diameters correspond exactly to the ¾-in. diameter of the flange, creating the spring-clip immobilization. **Rough handling tests confirmed the protective qualities of the new method.**

Field-use tests, conducted by our product development department, revealed that the possibility of kinking the tube during removal from the partitions was considerably reduced. Tests also disclosed that this tray could be used in blood banks as a convenient dispensing unit, with any number of sets from one to ten remaining protected, yet instantly ready for use.

Review Savings Attained

In examining the cost factors involved in the change of packaging techniques, we found savings realized in materials cost, labor time expenditures, inventory cubage, and shipping costs, the latter owing to the light weight of the ten-unit tray. Further savings resulted when we found that filled trays could be wrapped in lightweight, colored kraft, still retaining their rigidity and resistance to product damage. A 20-set shelf-pack unit was designed, using two trays, stacked one on the other, and a kraft wrapping sheet to which an identifying label is affixed.

The new package was designed

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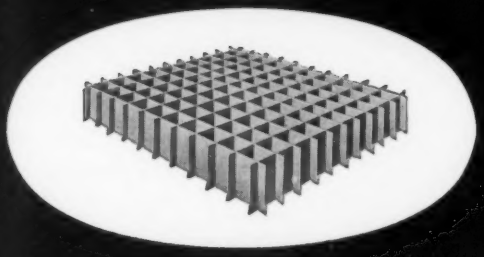

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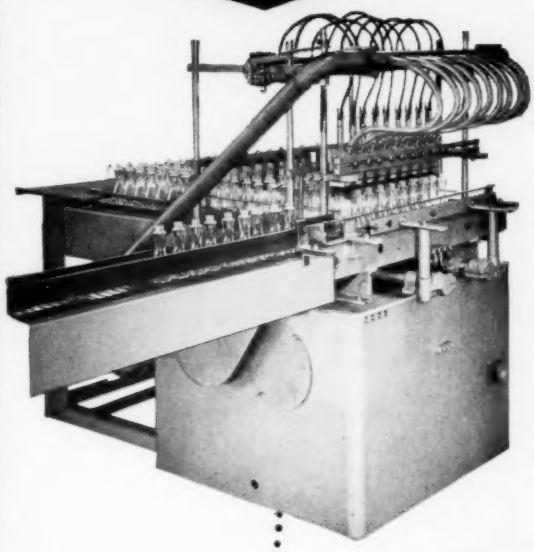

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Fig. 3. Sensi-discs in trays of 6 files each. Left: 6-file tray in folding box; center: two 6-vial trays in set-up rack with folding box; right: two 12-vial racks with 24-vial folding box.

also to serve as a conveyor unit which can be introduced on the production line immediately after final product assembly. This unit remains intact through all inspection and wrapping processes. **Elimination of separate single-purpose conveyor units brought increased efficiency. Inventory time has been cut down by the 10- and 20-unit packages** which afford a quick, error-eliminating means of counting stock.

Later, a **larger blood donor set,** with two simple sheathed needles and no flange (previously packaged in an individual folding box), **was also converted to tray packaging in order to duplicate the economy and efficiency achieved by our first use of those partitions.** These sets were easily coilable, hose-fashion, but still required separation, cushioning, and protection against kinking.

In this case, our product development department worked with the supplier on another adaptation of the compartmented tray. Two fluted partition strips, each flute ⅝ in. in diam., are affixed parallel to one another 3½ in. apart, at either edge of a backing strip 10½ in. wide. The backing strip is scored at the inner edge of each partition strip. The entire unit folds into a U-shape so that the compartments stand vertically, facing each other. Coiled donor sets are then inserted into the resulting double compartments—a simple packaging operation.

Carton Aids Use

A light weight folding box was designed for the 10-set unit. The box enables the end user to remove as many sets as needed at a time, by pulling out the tray from one end of the box to expose the required number, and then simply sliding the sets from their upright compartments. **Although it was found desirable to use a folding box rather than a kraft outer wrap,**

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- ***Reduces*** **box inventory investment**
- ***Cuts*** **unit cost of packages**

The Colt Rite-Size Box Machine is designed to make corrugated cartons *right in your own plant — as you need them.* It produces any size and style box you require, in small or large lots, quickly, accurately, and at lower cost! (A complete change in carton dimensions takes only a minute and one-half.)

With a Rite-Size Machine, box production can be coordinated with packing line requirements . . . to eliminate slowdowns and shutdowns due to carton shortages. Packaging is better, too, because cartons can be custom dimensioned to your products.

A complete box making department takes only 1600 square feet of space, *including storage.* Reductions in carton storage areas alone have resulted in floor space savings as high as 90% in many plants!

RITE-SIZE Box Machine is fully automatic and requires no special knowledge to run. Only one operator is necessary. Machine turns out 300 to 500 box blanks per hour.

Investigate the advantages of "in-plant" box making, today. There's no obligation. Write, phone, or wire for complete details.

COLT **PACKAGING MACHINERY COMPANY** 53 WASHINGTON AVENUE, CRANSTON 7, R. I.

savings and increased efficiency resulted.

PACKAGING "A CHALLENGE"

Our biological laboratory division developed a new medical laboratory-testing product which was a challenge to the packaging staff of our product development department. This product consists of small discs of paper impregnated with antibiotic and chemo-therapeutic agents for use in determining the microbial sensitivity of specimens to various anti-microbial agents.

For laboratory use, these were to be packaged 50 to a vial, to be available in sets of 6, 12, or 24 in various combinations for different tests. This posed problems of inventory and classification, as well as protection during packing, shipping, and storage.

Providing Visibility

Trays with fluted partitions and backing strips 1⅝ in. wide are cut into 6-partition lengths, and the vials clipped into the partitions. This provides antibreakage protection, and affords easy visibility of the vials for laboratory selection. A conventional folding box for the 6-vial tray was developed, and a special setup cutaway tray designed to hold two trays back-to-back and act as a 12-vial laboratory rack. A larger folding box package to contain two racks of 12 vials each was also designed.

Production tests showed that the 6-vial tray provided an ideal storage unit. The discs must be kept under refrigeration, and made up into sets of varying combinations as ordered. With the readily visible inventory and easy transfer made possible by the trays, workers can make up any quantity and variety of sets without undue disturbance of the remaining inventory, and with little chance of error in selection.

SIX-POINT PROTECTION

Most recent of our products to use the fluted ray method are two disposable hypodermic syringes (with and without needle attached). Disposable syringes immediately ready for use, with assured sterility and absence of cross-contamination, must be manufactured and sold in great volume to preserve the low-cost factor which permits their one-time use. Moreover, they must be made of glass to eliminate possible adverse effects often caused by noncompatible plastics.

Fig. 4. Using fluted tray, to protect against breakage and mutual contact, disposable hypodermic syringes are packaged in units of 5.

Requirements to be filled in packaging these disposable glass syringes were sixfold. **The package must afford:**

1. **Protection against breakage and damage to needle.**
2. **Immobilization of moving parts.**
3. **Low material cost.**
4. **Assured sterility protection.**
5. **Light weight to keep down shipping cost.**
6. **Convenience to end user.**

Getting A Tray

A simple tray, to be used in 5-partition units, was developed to meet these requirements. The unscored, flat backing strip is specified at 4⅜ or 5⅝ in., depending on whether a needle is to be included. The fluted partition strip is 2¾ in. wide. **Syringes, inserted into the partitions, are immobilized, are protected against breakage and mutual contact, and are easily counted and inspected.**

Cost of the package, which requires only a lightweight folding box for shipping, is very low. **The fact that the trays can be packed for shipping in quantities of five or any multiple thereof, with no need for additional partition inventory, added to this economy.** *(End)*

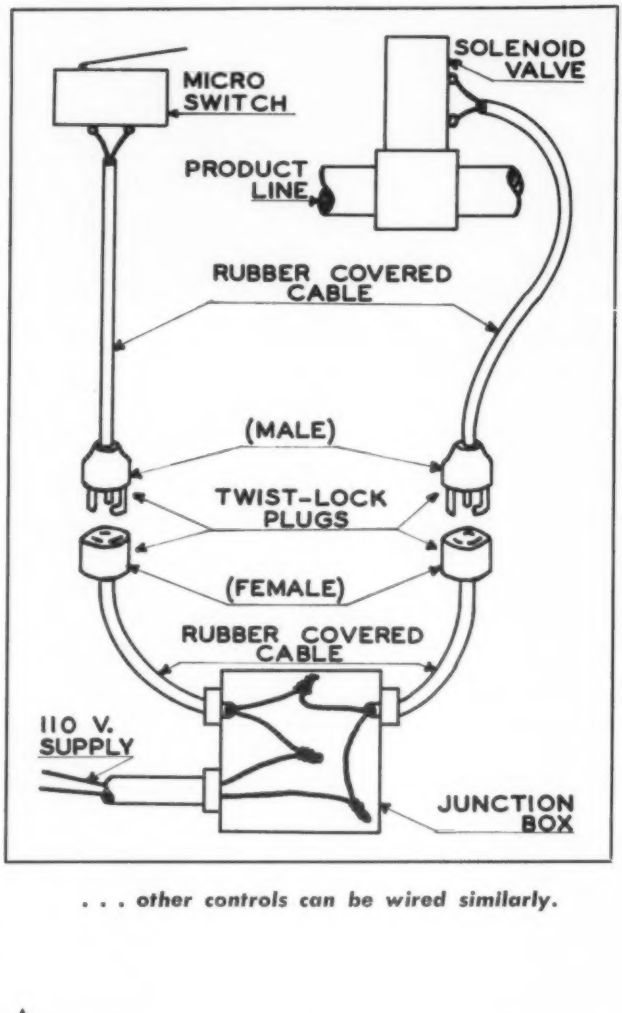
Fig. 5. A 5-partition unit of syringes is packed into folding carton. Cost of package is very low since it requires only lightweight folding box for shipping. Fact that trays can be packed for shipping in quantities of 5 or any multiple thereof adds to economy.

When troubles occur in automatic electrical controls, it often takes far longer to locate the trouble than to repair or replace the offending part. Here is one method of reducing the time needed for locating the trouble to about three minutes.

Troubleshooting automatic controls in three minutes!

By Fred J. Bush,
Engineering Manager, Chesebrough-Pond's, Inc., Clinton, Connecticut

Wiring for control of solenoid valve . . .



. . . other controls can be wired similarly.

Automation" has already become a widely-used word in industrial operations. It implies that all that need be done in order to produce is to push buttons. While this is theoretically true, the casual observer usually does not recognize that behind those buttons are all types of electro-mechanical controls which can go "haywire."

When this happens, things come to a screeching halt until the maintenance crew can locate and correct the trouble. Most manufacturers of complex electronic equipment today design the components so that they can readily be replaced merely by unplugging the defective unit and inserting a spare in its place. This permits maintenance to the defective unit without production interferences.

Modern equipment for packaging is employing control components more and more as the

Fred J. Bush was graduated from Stevens Institute of Technology and holds M.E. and M.S. degrees. He has taken many courses in administrative techniques, including the Alexander Hamilton Institute course in business administration. Before joining Chesebrough-Pond's as engineering manager, Mr. Bush held a similar position with the J. B. Williams Co. Previously, he was supervising project engineer for the Johnson & Johnson Co. Mr. Bush is a professional member of Packaging Institute and is active in American Management Association.

advantages of automation are more widely applied. **While the circuits employed are relatively simple, failure of these can cause production interferences and stoppages.** It becomes the lot of the maintenance operation to repair these failures as rapidly as possible.

Frequently, because of cycling or interconnection of controls, it becomes difficult to locate even the source of the failure—let alone correct it. This in itself can be a time-consuming operation. To reduce this time as much as possible, the idea of the use of "plug in" components was borrowed from the electronics industry.

Check Control Devices Easily

Our equipment consists of many so-called "standard" packaging machines as well as several specially designed machines. Most of this equipment has control switches, relays, solenoid valves, and the like controlling various parts of the operation. **We have so wired these control devices that they can be readily checked for reliability.**

Use Twist-Lock plugs. This is done by wiring all Micro Switches, valves, relays, etc., with ordinary Twist-Lock plugs which cost $1.85 each. The male side of the plug is connected to the device; the female, to the power source. When trouble occurs in a circuit, all that need be done is to unplug the suspected unit and test the action of the unit by attaching the leads of a circuit tester to the prongs of the male plug. **Complete control circuits can be checked in a matter of two to three minutes.**

Reduce Maintenance Time

In one installation on which we had been experiencing frequent electrical failure because of the particular operating conditions, we were able to reduce the maintenance troubleshooting time from an average of 60 minutes per call to about 8 minutes. This admittedly, is an unusual case, but is indicative of the improvement in maintenance effectiveness which can be made through the use of modern techniques. (*End*)

new HAYSSEN

RT

THE WORLD'S MOST VERSATILE PACKAGING MACHINE

Automatically packages products that other machines can't handle.

The Hayssen RT machine makes a specialty of packaging products usually "wrapped-by-hand". Knitwear, clothing, meat, spaghetti, hardware, even cotton swabs can be wrapped at high speed *without support cards or pre-cartoning.* Each package is formed independently, the product is never touched by machine parts. A simple screw adjustment raises and lowers package height; length is adjusted by an electric eye or mechanical timer. The RT forms packages with polyethylene and *all* other heat sealing material at speeds from 20 to 150 packages per minute. See the RT demonstrated with your product. *Write or call today.*

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HAYSSEN

MANUFACTURING CO., DEPT. PE-105, SHEBOYGAN, WIS.

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Announcements of machinery and products

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2. Now, *circle* the corresponding numbers on the postcard, opposite this page.
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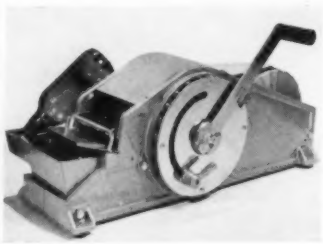
Reinforced/Kraft Tape Dispenser

Derby Sealers, Inc. announces the new Model 152-T dispenser for reinforced and kraft tapes. The



152-T dispenses predetermined lengths of tape up to 30 in. and in widths up to 3 in. It is equipped with a snap-out knife blade, patented pivot blade action, double-edge blade, hammer-type cutting mechanism, plastic water bottle, and predetermined length control. Optional features include Tape Straightener for reinforced tapes and a two-brush water tank and a heater attachment. Circle No. 1.

Self-adhesive Labels

Avery Label Co. announces its "Golden Perma-Grip" labels featuring an adhesive which clings to metal, glass, wood, plastic, rubber-coated objects, and rough or curved surfaces, and which, Avery says, gives pressure-sensitive labels 100 to 300 per cent greater gripping power than previous types. A specially-treated backing paper allows labels to be removed for application at temperatures ranging from (–)70° to (+)350° F. Circle No. 2.

Tablet Inspector

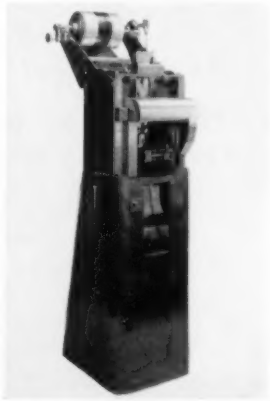
Popper & Sons, Inc. announces the availability of its new PerfeKtum Tablet Inspector, Chip and Powder Remover, Model TL-6. The TL-6 permits one operator to visually inspect tablets on both sides. Cyclone type unit removes undesirable chips and powder while tablets pass over two removable perforated plates. Inspection rate ranges from 50,000 to 150,000 tablets or capsules/hr. Circle No. 3.

Protective Packaging Material

Owens-Corning Fiberglas Corp. announces a fiberglas protective packaging material. The material retains all its characteristics (high compression resistance, damping and thermal efficiency, extreme resilience, fire retardance, noncorrosiveness and resistance to fungus and rot, Owens-Corning says) in temperatures from (–) 120° to (+) 375°F. It is available up to 96 in. long, from 1 to 72 in. wide and from ½ to 3 in. thick in ¼-in. increments. According to the company, it conforms to requirements of Military Specifications Mil-C-7769. It is available in four types: soft, medium soft, medium firm and firm. Circle No. 4.

Free Flowing Product Packaging.

Hayssen Manufacturing Co. announces the "Series J" addition to Compak automatic packaging



machinery. New unit uses rotary motion with dwell time and pressure, rather than reciprocating motion principle of operation. Compak Series J is available with scale, volumetric measuring, auger and liquid pump feeds. It hermetically seals heat-sealable supported material and will form pouch or pillow packages or seal on all four sides. Electric eye package design registration is available for preprinted stock. Speeds range from 30 to 150 bags/min., depending on size of bag and type of product. Minimum bag size is 1x2½ in. with maximum range of 8 in. x any length. Circle No. 5.

Aerosol Can Imprinter

Adolph Gottscho, Inc. announces an automatic packaging line imprinting attachment for coding

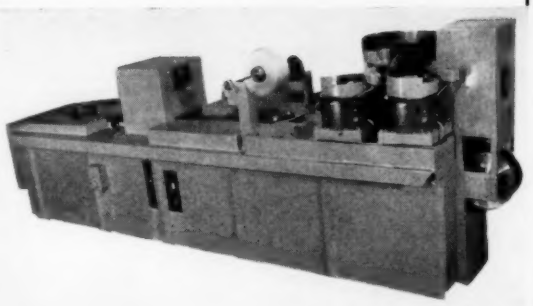
the bottom of aerosol cans. Designated "TB Aerosol Coder," it does not require cutting into existing packaging line, and does not need dead plates. Using simplified 2-roll fast-dry fluid inking system, unit affords imprints of one or more lines even on bottom surfaces recessed as much as ⅝ in. The TB aerosol coder operates at speeds up to 600 cans/min. and accommodates cans of different sizes without use of change parts. Adjustments for speed and can size can be made in matter of minutes, Gottscho says. Circle No. 6.

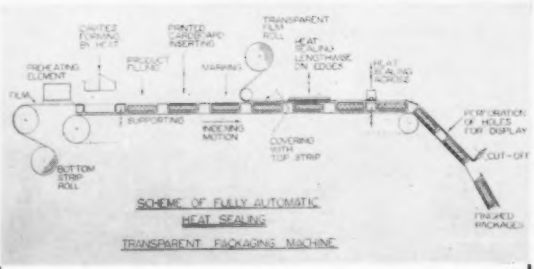
Bag Feeding/Opening Machine

Arenco Machine Co. announces a new automatic bag feeding and opening machine. To eliminate manual opening of bags, the Model VUF machine works in conjunction with weighing and proportioning equipment and can serve two machines at the same time. The machine automatically takes one bag at a time from the storage magazine by suction, opens and fixes it at station 1, moves it

RIMCO

Now fully automatic unit packaging with polyethylene





TRANSPARENT & DISPLAY PACKAGING

Machine forms package from two rolls of film for flat products, or forms blister for larger products.

Then automatically inserts product and backing into package and seals, labels, cuts and codes.

Will handle solids, liquids or powders, and is now successfully used to package hardware, food, medical supplies, cosmetics, oil, pharmaceutical supplies, textiles, etc.

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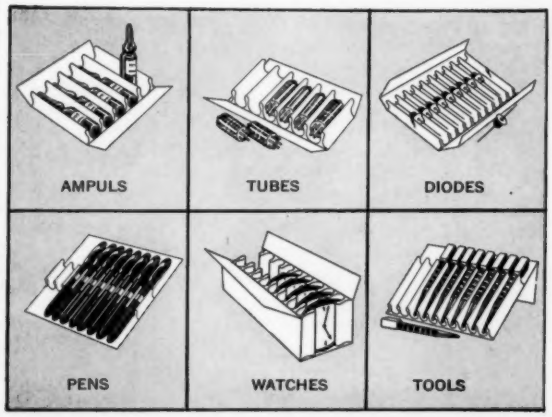
"the pack with the built-in shock absorber"

MEETS MANY INDUSTRIES' DEMANDS for SAFE, ECONOMICAL HANDLING of Small, Delicate Articles

The basis of the RONDO system is the spring-clip holding action of its fluted partitioning, or RONDO-lations, which secure inserted articles by means of their restricted openings. At the same time, a cushioning effect is accomplished to protect against damage from sudden impact.

RONDO offers a wide range of flute diameters (from 5/16" to 1-1/4") in different widths and a variety of designs to meet requirements for numerous articles.

RONDO, first used for protecting medical ampuls and vials, now serves the makers of electronic tubes and components, cosmetic containers, watch cases, tools, pens, crayons, artists' colors, counting and calculating mechanisms, and many other products of delicate nature.



RONDO PROCESS AND DESIGNS PATENTED IN ALL MAJOR COUNTRIES

ADVANTAGES of the RONDO System

- Articles exceptionally well protected against shock
- No additional padding needed
- Articles easily inserted into RONDO-lations by hand or machine
- Loading and Handling time cut considerably
- Articles always visible and accessible

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INCORPORATED
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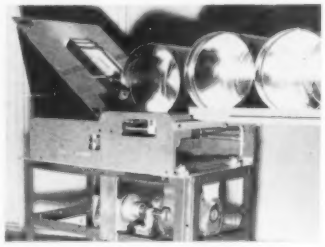
to station 2 where the bottom is opened by compressed air, then moves it to station 3 where filling takes place and filled bag is released to conveyor line or sealing machine. It has feature of taking its running speed from the working speed of weighers, but should weigher exceed speed of VUF, the VUF automatically controls filling speed. Bags used include SOS, satchel bottom, square bags with gussets and flat bags. Output speeds range to 35 fills/min., and storage magazine capacity is approximately 300 bags. Circle No. 7.

Intermittent Labeling Machine

Labelette Co. announces a machine for intermittent labeling of round containers featuring a duc-



tor roller that applies a thin, smooth coating of glue; stabilizing legs that tilt-up onto rolling casters; hardened shaft inserts designed to prevent excessive wear; open, easier-to-fill-and-clean glue tank, and a newly patented glue film lock. Machine handles containers from 1½-oz. to 1-gal. size, and is designed for intermittent labeling as spot, face, or wrap around applications. Overall dimensions make possible installation in 30x15-in. floor space. Circle No. 8.

High-gloss Paperboard Carton

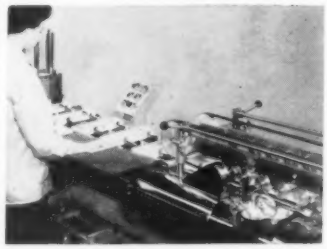
Diamond Gardner Corp. announces its Diamond-Glo cartons, featuring high-gloss paperboard and printing with ink pigments that stand on the smooth surface of board instead of soaking in. Board is adaptable to letterpress, lithography and gravure. Caliper range is from .014 to .035. It is available with standard back-liners—solid news, white or kraft. G.E. brightness range is up to 80. Circle No. 9.

Clear Plastic Clips

Anchor Plastics Co. announces "Invisible staples"—clear plastic extruded clips—sections which are made to fit the contour of pen, lipstick case, tube or small container to be mounted on a card. Clips are cut to any desired length and are snapped through a die-cut hole in card. Item to be displayed is then pushed through the opening thus formed. Integral flanges of clip section prevent pull-out of the clip once the item is inserted. Any tint or color can be supplied. Circle No. 10.

Bacon Cartoning Machine

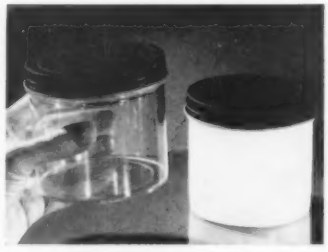
Lynch Corp. announces a new development (jointly developed with Marathon Div. of American Can



Co.) in bacon cartoning—carton is rectangular box with transparent film window, but is completely sealed on all sides. Bacon is removed by lifting sealed flap and sliding out inner tray. Unused bacon is stored by sliding tray back into carton and tucking flap. This stainless metal machine has finger-tip control and requires one operator. Filling rate is 50 cartons/min. after machine has set up carton. Sealing and dating of carton is then automatic. Machine is quickly adaptable for different size packages. Circle No. 11.

32-Oz. Plastic Jar

Celluplastic Corp. announces the addition of a 32-oz. plastic jar to its line of stock vials and jars.



Available in two models, (1) linear polyethylene with overflow capacity of 32.3 fl. oz., weight 211 lb./1000, (2) polystyrene with overflow capacity of 33.8 fl. oz., weight 212 lb./1000—either model takes standard 120 mm. closure available in black metal with pulp and vinyl liners. Circle No. 12.

Poly-laminated Paperboard

Eron & Eron, Inc. announces a new use for polyethylene laminated paperboard—as a printing surface on the outside of a carton. A specially formulated ink for proper binding on the poly-laminated coating was developed by Inter-Chemical Corp.'s Printing Div. Production and imprinting of the new packaging is being handled by Continental Folding Paper Box Co. Circle No. 13.

Web Splicer

E. T. Witherby Sales Co. announces a new web splicer which splices cellophane, paper, foil within 0.10-in. registration. Using a pressure-sensitive tape which is applied to the leading edge of a new roll, the splicer unites this edge automatically in registration to the trailing edge of depleting roll. It handles webs from 1.5 to 6.25 in. wide at speeds up to 400 lineal ft./min. and can be adapted for use on various types of reel-fed machinery. Circle No. 14.

Aerosol Valve Remover

Robins Engineering Co. announces its "Aerosol Valve Decrimper and Remover" to reclaim product

and container. Unit becomes part of existing aerosol production line where it automatically removes the standard 1-in. cup valves from aerosol cans and disposes of them. Another valve can then be inserted, can is re-crimped and re-gassed, so that rejects are used. Decrimper and remover is mounted on a 3-in. pipe stand, and is operated by a 4-in. air cylinder with a 6-in. stroke (valves with dip tubes need longer stroke so dip tubes will clear the cans). Circle No. 15.

Carton Opening Attachment

General Corrugated Machinery Co. announces an attachment, for its General Tapers, which automatically applies a "Rip-Cord" for opening cartons. Rip-Cord adheres along centerline of gummed side of Corrugators' tapes as tape is applied to the manufacturers' joint. For package user tape seal-

er, attachment automatically adheres Rip-Cord along centerline of gummed side of standard sealing tapes as tape sealer applies tapes to boxes, top and/or bottom. Regardless of length, a machine-cut, easy-lift tab is provided at each end of tape. General's application of sealing tapes features alignment, lateral and end centering, exact tape lengths, uniform wetting for entire length with doctored water-roll control, positive rolled-in adhesion of entire gummed area for maximum holding strength. Circle No. 16.

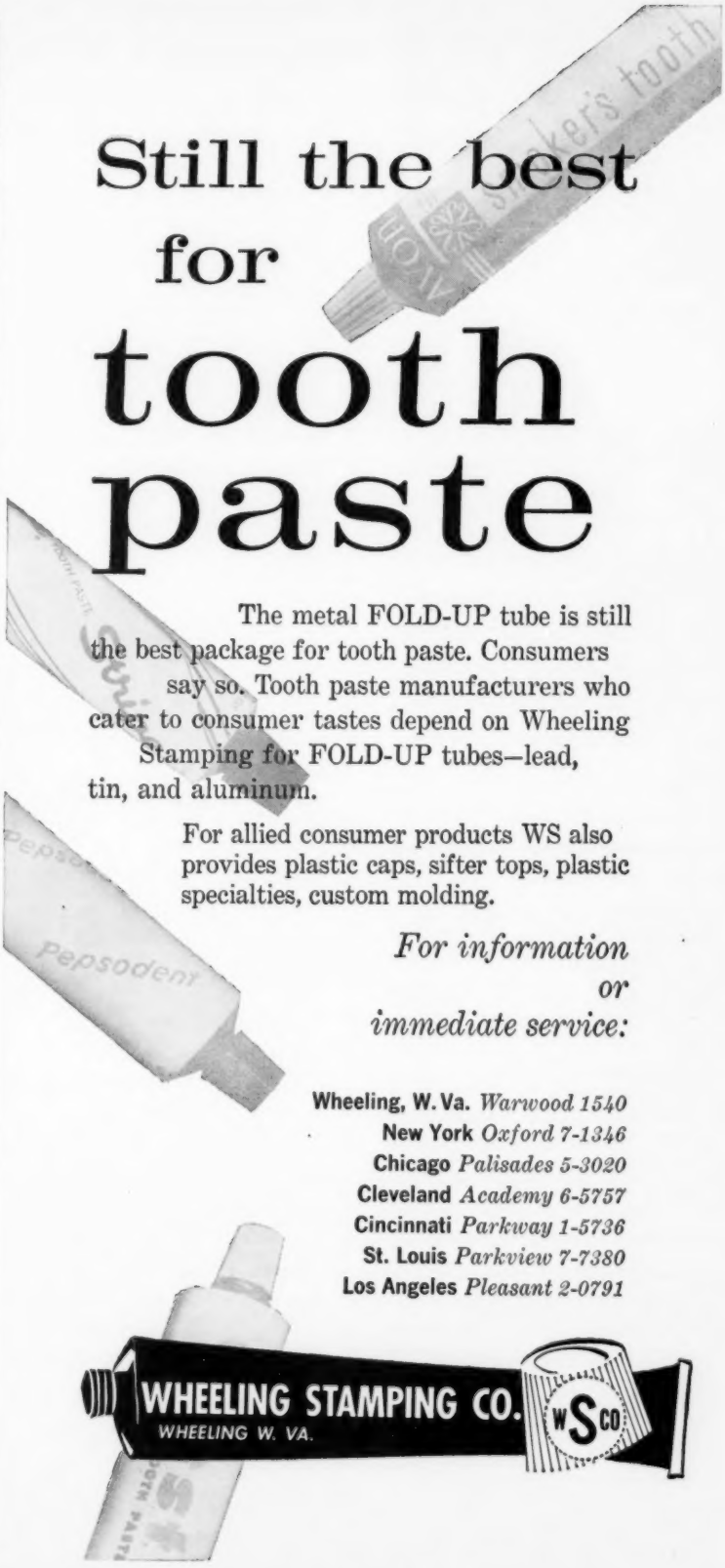
Automatic Case Selector

Atronic Products, Inc., announces its Model 410 carton selector, making possible the selection of any

type case, box, or carton regardless of size or shape by means of a 5-bar code. Designed for operations where carton selection cannot be made on basis of size, the Model 410 counts and sorts any of 30 different items as goods move along a conveyor. Selector also provides an output signal that can be used as needed, as to activate a conveyor switch to control flow of goods for carton sealing, and so on. Selector switches may be set to recognize any one of the markings as cartons pass at speeds up to 180 ft./sec. Code may be printed at same time other printing is done. The unit is completely transistorized. Circle No. 17.

Sanitized Cushioning Material

Blocksom & Co. announces a new Sanitized cushioning material for custom rubberized curled hair packaging. "Sanitized" is a chemical bacteriostat additive which insures protection against bacteria and germs. Blocksom's Parametric packs will now be resistant to mold, mildew, rot and fungus. They also will be nontoxic, nonirritating, antiseptically clean and resistant to odors. Sanitized's bright green color meets specifications of commercial and military shipping and storage needs, Blocksom says. Circle No. 18. (End)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Vibratory Feeders

Eriez Manufacturing Co. offers literature on its vibratory feeder, available in five different models. Featuring an electro-permanent magnetic drive, these feeders offer full feed or dribble feed with up to ± 2 per cent control on most materials. Units will handle dry materials ranging in density from 40 to 150 lb./cu. ft., for such feeding operations as spreading, separating, and proportioning prior to filling. Circle No. **101.**

Piston Filler

Elgin Manufacturing Co. has available a data sheet listing specifications for its "Speed-King" two-valve filler. Developed to handle liquid and semiliquid products, it accommodates jars or tins in sizes from 1 oz. to 1 gal. Filling speeds range from 18 to 126 containers/min., depending on product and container size. Circle No. **102.**

Cellulose Sheeting

Eastman Kodak Co., Cellulose Products Div., offers a 4-page bulletin, "Properties of Kodapak Sheet," a thermoplastic cellulose ester sheet. Graphs and charts outline the physical properties of the three available types. Circle No. **103.**

Automatic Jaw Sealer-Labeler

Doughboy Industries, Inc. has a 2-page data sheet on its automatic jaw sealer-labeler, Model PJS. Head labels are applied and bags sealed in one operation for cellophane and coated cello bags, polyethylene, Saran, and so on. Machine holds bag for complete sealing cycle, enabling operator to increase production up to 50 per cent, Doughboy says. Circle No. **104.**

Bottle Labeling Adhesive

Swift & Co. has a folder describing properties and uses of its three grades of adhesives for jar and bottle labeling, all adaptable to semiautomatic or automatic equipment as well as hand labeling operations. Handling suggestions are included. Circle No. **105.**

Package Testing Machinery

Testing Machines, Inc. has available a folder containing bulletins on all the testing machines it manufactures and distributes, including impact, stress and strain, compression, crush testing machines and many others. Prevailing prices are included. Circle No. **106.**

Thermal Impulse Heat Sealing

Vertrod Corp. has an 8-page brochure giving specifications for six models of thermal impulse sealers. These units weld thermoplastic films by introducing a heat impulse and then cool film under pressure. Machines listed range from portable hand models with 4-in. sealing length to a floor model with a 42-in. sealing length. Circle No. **107.**

Automatic Packaging Machinery

Wright Machinery Co. offers a 34-page illustrated brochure presenting data on its bagging and weighing systems, "Junior weigher," candy cleaner, electronic weigher and other machinery. The purpose of each piece of equipment, the products it handles, how the machine functions, and the standard specifications for each are included. Circle No. **108.**

Package Sterilization

Wilmot Castle Co. is offering a 12-page brochure outlining its complete program on package sterilization. Types covered are steam, dry heat, and gas sterilization by inerted ethylene oxide. In addition to discussing how they research a product and package, engineer procedures, and direct installations, they list a number of products normally requiring sterilization and the method generally recommended. Circle No. **109.**

Foot Power Staplers

Fastener Corp. has 4-page folder illustrating a line of "Duo-Fast" staplers for packing, shipping and woodworking industries. The models described are designed to handle almost any stapling situation that might arise in such industries. Pictures of staplers in action are included. Circle No. **110.**

Straight Line Filler

The Filler Machine Co., Inc. offers an illustrated data sheet on the Model SL-55 straight line filler, designed to handle semiliquid and semisolid products such as jellies, mayonnaise, salad dressing, cosmetics, pharmaceuticals, petroleum, and chemical products. Five types of this model are available with speed ranges up to 300/min. It is constructed to handle ½ to 32 oz. glass, metal and plastic containers. Features are: air-operated valves that cut off instantaneously regardless of cycle speed, a "no-container, no-fill" device, and stainless steel construction of contact parts and parts around the filling zone. Circle No. **111.**

Carton Filling And Sealing

Food Machinery Corp. Packaging Machinery Div., Stokes & Smith Plant, offers an 8-page folder describing its complete line of "Neverstop" automatic carton filling and sealing machinery which handles free-flowing products. Specifications for six models are included with choice of speeds, carton size, glue, filling method and optional equipment. Circle No. **112.**

Bag Closer

Dave Fischbein Co. has a 4-page bulletin giving details on its portable bag closer. It weighs 10½ lb. and plugs into any electrical outlet, requiring no installation. It handles textile and paper bags, closing an average 100-lb. bag in less than 6 sec., according to its manufacturer. Stitch range is from 4 to 5½ stitches/in. Circle No. **113.**

Polyvinyl Resin Adhesives

Armour & Co.'s Adhesive Div. has available a 4-page brochure on its "Seban" line of polyvinyl resin adhesives. Brochure illustrates several uses of "Seban" and lists some gluing machines on which it is used. Circle No. **114.**

Vacuum Fillers And Body Labelers

Biner-Ellison Machinery Co. has a catalog describing its line of fillers and labelers. Specifications and pictures are given for 9 different machines, some of which fill and label simultaneously. Fillers are designed to vacuum-fill still liquids, and labelers apply body labels handling a range of glass containers and label sizes. Circle No. **115.**

Stapling Tools

Bostitch has published an illustrated 8-page brochure which describes 50 stapling tools for the shipping room. These units perform such fastening jobs as assembling, top and bottom sealing corrugated boxes, sealing light and heavy weight bags, attaching liners, padding, and covering. Circle No. **116.**

Hot Melt Sealing

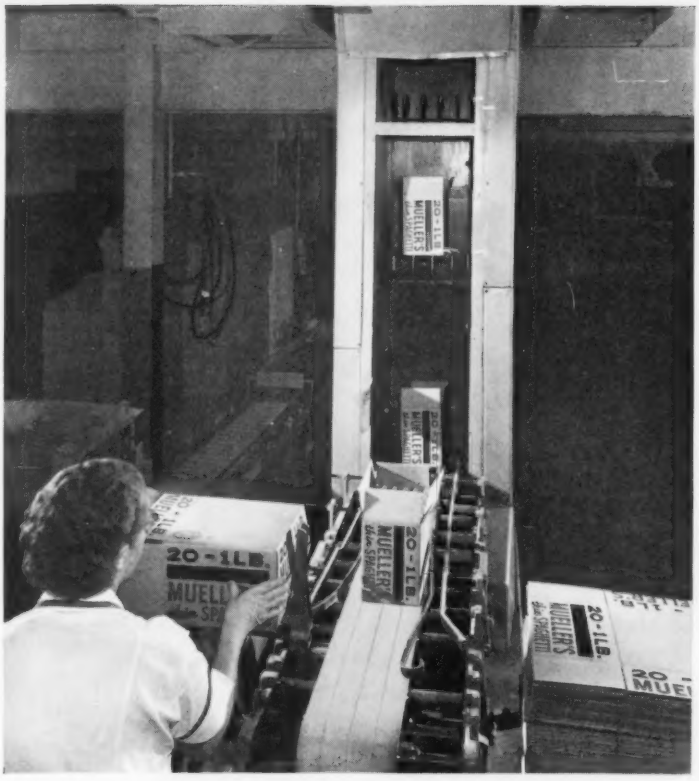
Clybourn Machine Corp. offers literature on its hot melt "Glu-Pac" cartoning machine featuring hot sealing, and automatic carton setup and insertion. The hot melt seal is air tight from -30° to 160° F. and has fiber tearing adhesion. Speed ranges from 40 to 60 cartons/min. Glue applicators are removable. Circle No. **117.**

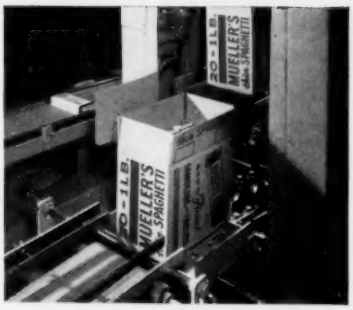
Cellophane Opening Tape

Dobeckmun Co. has an 8-page illustrated booklet, "How to use Zip-Tape." It gives information on storage conditions, duration, handling on and off machine, breaks and splicing. Circle No. **118.**

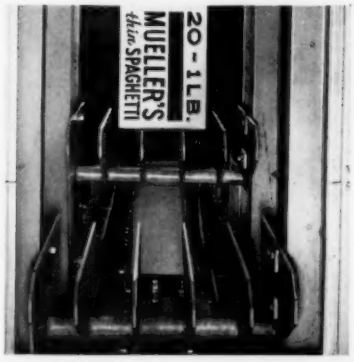
Package Labeling

Dennison Manufacturing Co. has a brochure describing a labeling process called "Thermagraphy." This method involves the transfer of a pre-printed label design from a roll of special label paper directly onto

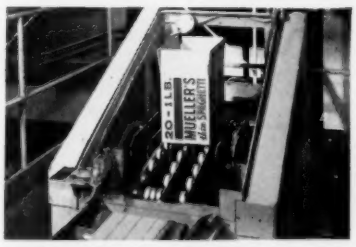




Close-up shows a filled carton beginning its gentle Tray Elevator ride upward. In the foreground, the next carton in line has moved off conveyor belt and is automatically held back until oncoming tray appears.



Moving straight up, the carton rests on a fixed, non-pendulum tray that neither swings nor sways . . . always holds carton steady, secure. Note how carton's open end bottom is held in a closed position until it reaches the sealing unit.



Just beneath the room's ceiling, the carton leaves the tray via rollers. Conveyor belt then takes over, moving carton through the sealing operation. Although a six-per-minute schedule is timed here, the elevator can move up to 15 cartons every minute.

Space-Saving Tray Elevator Boosts Mueller Production!

Because this Robo-Lift Tray Elevator ascends straight up, C. F. Mueller Co., Jersey City, increased production without costly remodeling. To cope with stepped-up consumer demand, the nation's largest macaroni manufacturer rearranged and increased the capacity of its product weighing, packaging, cartoning and sealing operations. To hike the output, engineers placed the automatic sealing unit high above floor level. However, due to cramped quarters, a vertical elevator was needed to carry product-filled cartons to the sealer.

Only the Lynch Robo-Lift Tray Elevator met all requirements and specifications.

Space-saving and jam-proof, the automatic upright operates a sixteen-hour shift, handling cartons at the prescribed rate of six-per-minute. Featuring unique infeed and discharge systems, the elevator cannot jam —ever. And, unlike bar and belt-type models, it doesn't mar or rub a carton's printed message. Through fixed positioning of trays, pendulum action is eliminated and cartons ride safe, secure, easy.

Robo-Lift Tray Elevators are available for a variety of lifting or *lowering* assignments. For full details on how Tray Elevators serve, request free literature, today.

Write for illustrated booklet which details the complete story titled, "LYNCH Robo-Lift Tray Elevator . . . moves cartons vertically, saves time, money, floor space at C. F. Mueller Company."

Lynch Corporation—*Manufacturing Engineers of automatic processing equipment for the glass, packaging, plastic and other industries.*

Atlanta • Chicago • Wallington, N.J. • Kansas City, Kansas • San Francisco

LYNCH
CORPORATION
Anderson, Indiana

the unprinted packaging material. The result is said to compare with printed film and offers better adhesion, less bulk, and faster application than conventional labeling according to Dennison. It is suitable for reverse plate printing, halftones, and process color work. Transfer unit can be attached to wrapping, bundling, or bag-making machines. Circle No. **119.**

Shipping Case Sealer

Chisholm-Ryder Co. of Pennsylvania offers Bulletin No. 1498, a 4-page brochure describing its Model F case sealer. This machine applies glue to preheated flaps of standard shipping cases. It features an enclosed glue system, short compression unit and single motor drive. Specifications and maximum capacities for various case sizes are included. Circle No. **120.**

Automatic Cartoner

Container Equipment Corp. offers a bulletin describing its Model 40 cartoning machine which automatically moves cartons from flats in the hopper to closing or sealing stations, allowing for hand insertion of the product. Producing sealed cartons up to 90/min., machine handles glue-seal, straight-tuck and reverse-tuck cartons, and combinations of these. Carton sizes handled range from 1 in. long, ½ in. wide, 1⅝ in. deep, to 10 in. long, 5 in. wide, 30 in. deep. Circle No. **121.**

Fluted Cushion Trays

Rondo of America, Inc. offers a brochure outlining the characteristics and applications of protective packaging with fluted trays. Made of lightweight paperboard formed into rows of consecutive flutes which serve as nests for fragile products, these trays are available in variety of styles and choice of cover flaps. Designed to cushion against shock, they are suitable for packing electronic tubes, hypodermic needles, ampules, crayons, and so on. Circle No. **122.**

Packaging Adhesives

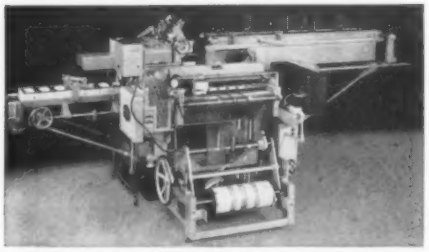
Arabol Manufacturing Co. has a booklet entitled, "How to buy adhesives for better adhesion," which offers 23 yardsticks for selecting the right adhesive for a particular application. Some factors to be considered: material being used, length of time adhesive must "stick," conditions such as dry heat, dry cold, moisture with which product may come in contact, how adhesive is to be applied. Circle No. **123.**

Gases For Aerosols

Air Reduction Co. has a 6-page brochure discussing its packaging laboratory where food and nonfood products are evaluated to determine their adaptability to compressed gases for aerosols, purging, blanketing, and so on. Laboratory also provides pilot plant packaging facilities. Circle No. **124.**

Metal Parts Packaging

Wood Conversion Co. offers brochure No. 645-458 containing samples of "Tufflex" neutral cushioning fabrics used for protecting small parts in shipment and storage, and vertical liners for tote boxes, assembly table and storage bins. These fabrics conform to the packaging specifications of the U.S. Army. Illustrations of packaging methods are included. Circle No. **125.**



NOW YOU CAN HAVE TOMORROW'S OVER-WRAPPING MACHINE TODAY! Battle Creek's completely new Model 475 successfully handles more than 40 different formulations of soft plastic film . . . your assurance new plastic film developments will not outdate this machine. Change of films requires only electronic heat adjustment. Size changes are made in 15 minutes. Wraps up to 75 per minute within 5″ to 12″ lengths, 3″ to 8½″ widths and ¼″ to 4″ heights. Choose any of these films — polyethylene (medium, low and high density 1 mil and up), polystyrenes, heat sealing cellulose acetates, heat sealing foils, polyvinyl chlorides, cellophanes, polypropylenes or polymer coated films. **Battle Creek *"Continuous Flow"* Packaging Machines, Inc., Battle Creek, Michigan.**

Adhesives

H. B. Fuller has available a booklet describing characteristics of some of its standard line adhesive products applicable to film, foil, bags, envelopes, folding and set-up boxes, and for case sealing and bottle and can labeling. Circle No. **126.**

Labeling

Economic Machinery Co. is offering a 16-page booklet, "Labeling Lines," giving suggestions for more successful labeling. The six subjects covered are: application of foil labels, factors influencing successful labeling, adhesives, size and shape of wrap-around and neck labels, plant layout and better bottling and labeling. Circle No. **127.**

Transistorized Electronic Counter

Veeder-Root, Inc. has an information sheet describing and giving specifications for its electronic predetermining counter, Series 1604, Model R. Unit can be furnished with photohead to match specifications and is designed for operation by non-technical personnel. It is transistorized and operates at speeds up to 500 counts/sec. Circle No. **128.**

Solid Plasticizers

Monsanto Chemical Co. has available a booklet detailing uses of solid plasticizers in adhesives, lacquers, foams, films and rigid plastic compositions. Also included are specifications of 14 solid plasticizers now available. Circle No. **129.**

Foil Packaging Machinery

Reynolds Metals Co. has available a 4-page folder on its Hayssen-Reycon Tuckwrap machine (jointly developed with Hayssen Manufacturing Co.) for positioning and crimping aluminum foil covers on frozen dinner trays, pot-pie pans, main course trays and other type aluminum containers. With die change, machine can be converted to handle any size round or rectangular container. Available for use with the tuckwrap machine, the "Reycon" container dispenser makes it possible to dispense containers, fill them, and position and crimp tuckwrap lids in one continuous operation. Circle No. **130.**

Packaging Line Machinery

Frazier & Son offers a 6-page illustrated brochure on its machinery for packaging lines—maetrials handling equipment, conveyors, filling machines and net weighers. Machinery described includes "Whiz-Packer" semi- and fully automatic volumetric and rotary fillers; "Whiz-Packer" automatic and semi-automatic net weighers for products such as noodles, candies and twist wraps. Circle No. **131.**

Aerosol Packaging Lines

Mojonnier Associates Div., Kartridg-Pak Machine Co., offers a 6-page illustrated folder on its 800 and 900 series. The 800 line is composed of standard 2- and 3-ft. stainless steel sections, bolted together to form one table 30 in. wide. Length depends on units used. Available in single or double track design (capacity up to 7200/hr.) Additional units may be added or substituted at any time. The 900 line is composed of continuously operating rotary units with cintinuous-motion conveyor. Each unit is controlled by its own motor and

variable speed drive. Any variations in speed are automatically adjusted by slippage on the surface of the conveyor. Containers are fed from conveyor into each rotary unit by means of a helical worm drive which "screws itself" into the line of cans. Circle No. **132.**

Heat Sealing For Supermarket Use

Ralph Chaffee & Co. offers information on its 4 heat sealing units for supermarkets and general use. The 4 units are a hand-iron suited for label sealing, a hot plate for trayed items and packed items, a hand-operated and a foot-operated bag sealer. Circle No. **133.**

Shipping Room Pointers

Mid-States Gummed Paper Co. has a 24-page booklet, "Shipping Room Pointers," discussing various types of tapes, their uses, how tapes should be stored, how to get best results from tape dispensers and many other ideas for application. Circle No. **134.**

Cellophane Data

E.I. duPont de Nemours & Co. (Inc.), Film Dept., has available a brochure, A-6166, that lists the properties and uses of 30 varieties of cellophane for the packaging requirements of many products. It includes a chart showing the yield, thickness, principal uses, and properties of plain, moistureproof, heat sealing, and polymer-coated films. Circle No. **135.**

Corrosive Liquids Packaging

Jones & Laughlin Steel Corp.'s container division offers information on its seamless, blown-in-one-piece polyethylene plastic lined steel pail. The liner was developed by J&L and Plax Corp. Called the "Jaliner," it can be used for packaging and shipping such products as acids and alkalies, food concentrates, photographic chemicals, electrochemicals, insecticides, and battery electrolyte. Available in 5-gal. size. Circle No. **136.**

Electronic Counting/Control Equipment

Freed Transformer Co., Inc. has available an illustrated catalog, No. 5920, of its line of high speed electronic counting and control equipment. Industrial and manufacturing applications for units include totalizing counters for unit counting, preset counters for semiautomatic or fully automatic control applications, preset interval generators for timing applications and modular counters. Circle No. **137.**

Vacuum Forming Equipment

Comet Industries has available a 4-page illustrated folder on its "Star" vacuum forming machine. It has two counteracting platens which are electrically driven and independently controlled. Each contains a separate vacuum and air pressure system. Forming techniques possible are straight drape and vacuum forming, inverted drape and vacuum reverse, billow forming, air cushion forming, pressure forming and ring and punch forming. Circle No. **138.**

Marking Machine

Van Buskirk & Co., Inc. offers a leaflet on its tape core marking machine which automatically marks the inside wall of cut-to-width cardboard cores with a code/date

It can't be just "adequate"...

PACKAGE MARKING

either makes money or wastes it

Readable, attractive marking made by Markem machines on your boxes or labels helps them from the moment they're marked to the time they're used — and can even help future sales as well. Good marking speeds handling . . . reduces waste and packing errors . . . allows quick selection by customers . . . simplifies and encourages reordering . . . carries the "quality" message of modern package design.

In contrast — *hard-to-read, uneven, "home-made" marking is a hindrance to your package or product from beginning to end* — and can actually waste thousands of dollars a year.

And a Markem marking method makes important "in-plant" savings as well. The right Markem machine, type and specialty ink working in your plant marks the *right* quantities at the right time — with savings in inventory, labor and delivery time . . . eliminates waste from obsolescence . . . handles "short runs" rapidly and economically . . . provides flexibility that allows *one machine to do a variety of marking jobs.*

Call your local Markem man or write directly, enclosing samples and requirements. Markem Machine Co., Keene 35, N. H.

MARKEM

everything industry needs . . . for profitable marking . . . since 1911

For more information circle No. 251 on Reader Service Card, Page 66

number, trade mark or product and type identification information. Available in 5 models, all featuring speed of 75/min., imprint width to ½ in., removable print drum and removable ink system. Circle No. **139.**

Remote Weight Recording

Toledo Scale Corp. has available an 8-page brochure, Form 2975a, on the transmitting and processing of weight data. Systems described and illustrated include those using the Direct Digital Scanner which electronically transmits a continuous signal of weight being applied to the scale and also the Direct Digital Selector which is an electromechanical device that sends an electrical signal when the scale indicator reaches the accurate weight indication. These transmitted weights are recorded and processed on adding machines, typewriters, tape punch or card punch units or indicated in illuminated numerical form. Circle No. **140.**

Cellulose Wadding

Cel-Fibe Div., Personal Products Corp., offers an 8-page illustrated brochure on its cellulose wadding material. Regular types of Cel-Fibe wadding include bleached, unbleached, facial-tissue quality, moisture-absorbent, moisture-resistant, wet-strength. Applications in handling, shipping, storage, converting and manufacturing are shown. Circle No. **141.**

Work Transfer Devices

Alden Systems Co. has available the Alden Systems Handbook giving descriptions and prices of its work transfer devices—such as, building block conveyors from 2 to 12 in. wide, travel tracks and trolleys for moving chassis, transport dollies that fit into assembly line, unit integral conveyors 15 to 30 in. long for carrying parts from the process to main conveyor or transfer device. Circle No. **142.**

Aerosol Valves/Components

Valve Corp. of America, Inc. has a catalog sheet describing its "Valvu" board, a 3-dimensional "catalog" of aerosol valves and other components. The sheet describes the sample units and valve components actually mounted on two 11x14-in. framed boards being offered to aerosol packagers and aerosol manufacturers. Boards hold mounted working models of units designed for metered and nonmetered glass, metal and plastic containers. Circle No. **143.**

Resin Adhesives

Morningstar-Paisley, Inc. offers information on its "Solu-Rez" series of low-viscosity, multi-purpose polyvinyl acetate resin adhesives. Advantages include suitability on most carton sealing and forming equipment at high production line speeds, bonds on different types of carton surfaces, low viscosity and spreadability, washability of machine parts and reservoirs. Circle No. **144.**

Granular Hot Melts

National Starch Products Inc. offers information on its "Instant-Lok," a 100 per cent solids, resin adhesive for polyethylene, foil, wet strength kraft and other stocks. These adhesives extrude into a continuous glue line. No compression, water, mixing or preparation is required. Suggested for bag seaming, carton sealing and forming, tube winding. Circle No. **145.**

Hot Melt Applicator

Potdevin Machine Co. has information on its "Instant-Lok" hot melt applicator. Designed for use with National Starch's "Instant-Lok" adhesives, applicator converts adhesive to liquid state and applies automatically with immediate pressure. When running webs of conventional materials where wet adhesive is adequate for bond, the applicator can be disengaged; can also be used in conjunction with wet adhesive when reinforced bonding is desired. Thickness and width of line of adhesive is adjustable. Correct temperature is maintained by thermostatic control built into applicator. Circle No. **146.**

Cook-in Pouches

Continental Can Co.'s Flexible Packaging Div. has available a 4-page folder on cook-in pouches entitled "Expand your market through unmatched cooking convenience." Included are advantages, market possibilities, kitchen ease features, the four major types available and a list of technical tips for prospective users of the cook-in pouch. Circle No. **147.**

Extruded Plastics

Midwest Plastic Products Co. offers a catalog showing applications of its thermoplastic sheet. Available are cellulose acetate, cellulose acetate butyrate, high impact polystyrene, high gloss impact polystyrene, low and high density polyethylene, ABS polymer and polypropylene—in sheet or roll. Circle No. **148.**

Silicone Defoamer

Dow Corning Corp. has available a 4-page illustrated brochure on its "Antifoam B." Designed to disperse immediately in aqueous solutions, "Antifoam B" kills foam without stirring, mixing, or agitation. Applications include adhesives, paper, metalworking, textiles and chemical processing. A price list is also included. Circle No. **149.**

Contract Packaging

Acepak, Inc. offers a 4-page brochure on its contract packaging facilities which include product development, compounding, packaging, plus warehousing and drop shipping. All types of filling services are offered, including flexible packaging and plastic tube equipment. Circle No. **150.**

Plastic Catalog

Cadillac Plastic & Chemical Co. has a 64-page catalog of plastic sheets, rods, tubes, films, blocks and flat tubings. Cements, pigments and miscellaneous supplies are also listed. Catalog lists available sizes, weights, color ranges, textures, purchasing specifications, grades and prices. Includes a 2-page comparison table of chemical, electrical and mechanical properties. The catalog enables price-property comparison of acetate, acrylic, butyrate, Implex, Kel-F, Mylar, nylon, phenolic, polyethylene, polystyrene, high impact styrene, Teflon and vinyl, in cast, extruded, molded and laminated shapes. Circle No. **151.**

Heat Sealer

Product Packaging Engineering has available a data and specification sheet on the Comet 54 UL heat sealer, a bench-type, foot-operated unit that handles most all sealable thermoplastic materials. Circle No. **152.**

Gummed Label Test Kit

Minnesota Mining & Manufacturing Co.'s Mid-States Gummed Paper Div. offers a folder (printed on "Prone," a noncurling gummed paper) containing a test-size sample of each of the ten white and colored stocks available in the "Prone" line. Circle No. **153.**

Marking And Sealing Hints

Marsh Stencil Machine Co. offers a 24-page booklet, "Marking and sealing shipments made simple." Subjects covered include, how to stencil mark goods for safe delivery; how to save on sealing cartons with gummed tape; proper kind of ink to use for all kinds of marking; three ways to stencil—brush, roller, spray; conversion tables for weights and measures; export marking data, and a scale for measuring in inches and centimeters. Circle No. **154.**

Aluminum Cans

American Aluminum Co. has available an 8-page brochure on standard drawn round aluminum cans. Cataloged are 335 standard stock sizes ranging in diameter from 11/16 to 25 in. Heights are made to customers' requirements. General information on material, type of finish, packaging and method of ordering is also included. Circle No. **155.**

Molded Plastic Containers

Bradley Industries has available a 20-page booklet giving specifications and prices for its line of molded plastic containers. Line includes hinged boxes, telescope and slide cover boxes, square and rectangular boxes, round boxes, vials, hinged compartment boxes and a miscellaneous group. Circle No. **156.**

Adhesives

The Franklin Glue Co. offers a pamphlet describing the characteristics, film properties, adhesion properties, suggested uses plus test samples of its "Multibond" adhesives. Some properties of Multibond adhesives are: adherence to variety of materials; application as 50 per cent solids from water emulsions (nonflammable and nontoxic vapors); application by roller, brush, or spreader, and they can be used as wet adhesives or pressure sensitive ones. Circle No. **157.**

Plastic Extruders

Hartig Extruders, Midland-Ross Corp., offers a 28-page illustrated booklet giving specifications for its extruders and accessory equipment. Some applications for Hartig extruders are laminating; film and blown tubing; blow molding; pipe, tubing, rod and profile; wire insulating and cable sheathing. Some of the materials handled are nylon, polystyrene, rubber, cellulose acetate and polyethylene. Circle No. **158.**

Automatic Nailers

United Shoe Machinery Corp. is offering a folder which describes 4 models of its "Powasert" automatic nailer, Model B. These pneumatically operated machines handle virtually any nailing operation at speeds of approximately 50/min. Applications include the making of specialty crates, made-to-order boxes and pallets. Circle No. **159.** (End)

THILCO

POLY-KRAFT

HEAT SEALABLE

POUCH PAPERS

KIRSCH
Kirsch BRACKETS
EXTENSION DOUBLE CURTAIN RODS
PROBLEM: Machine package curtain rod hardware in a protective pouch complete with printed trade-mark identity and installation instructions.
SOLUTION: Thilco clear polethylene coated M. F. Kraft permits high speed machine sealing — provides protection from dirt, corrosion and loss of parts.

offer "field-tested" proof of packaging superiority for protection and automatic machine forming

THILCO'S diversified range of Poly-Coated paper combinations solve these packaging problems

PROBLEM: Package dry soup mix in sales appealing print labeled pouch with positive protection from moisture absorption.

SOLUTION: Thilco white M. G. Kraft is foil laminated one side and clear polyethylene coated on other side for required moisture barrier. Eye catching 4-color label decoration is Thilco flexo-printed on gleaming foil side.

PROBLEM: Protect plastic switch plates from dirt and moisture — identify product, and permit consumer selection without opening package.

SOLUTION: Thilco trade-mark decorated M. G. Kraft with scuff-proof, varnished overlay on one side and clear polyethylene coating on other provides protection and medium for heat sealing to "see-thru" cellophane that forms pouch.

PROBLEM: Provide a moisture barrier pouch packet to prevent "caking" of hygroscopic dye granules.

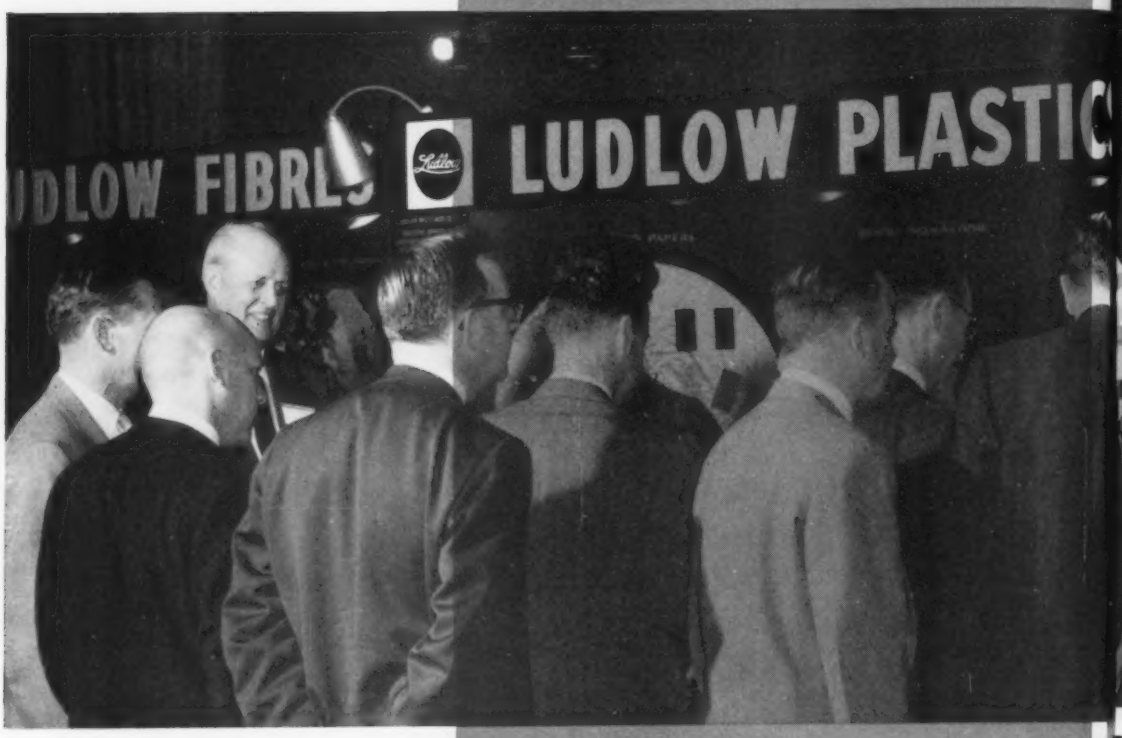
SOLUTION: Thilco polyethylene one side coated M. F. Kraft furnishes the ideal moisture barrier combination. Thilco flexo-printing provides the all-important trademark identification.

THILCO
Functional Papers
THILMANY PULP & PAPER COMPANY
KAUKAUNA · WISCONSIN

NEW YORK • DETROIT • CHICAGO • BOSTON • CINCINNATI

Get this free "tell-all" kit of samples

Complete, manual style kit contains sample grades of Pouch Paper combinations and helpful information guide on types, sizes and styles of pouches produced on automatic packaging machines.



Other new Ludlow Films:

PARAPLENE — high-density polyethylene

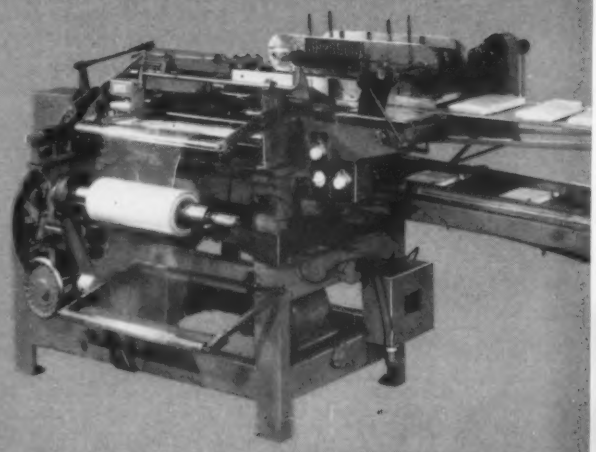
ORTHOPLENE — low-density polyethylene

PROPLENE — made from polypropylene resin

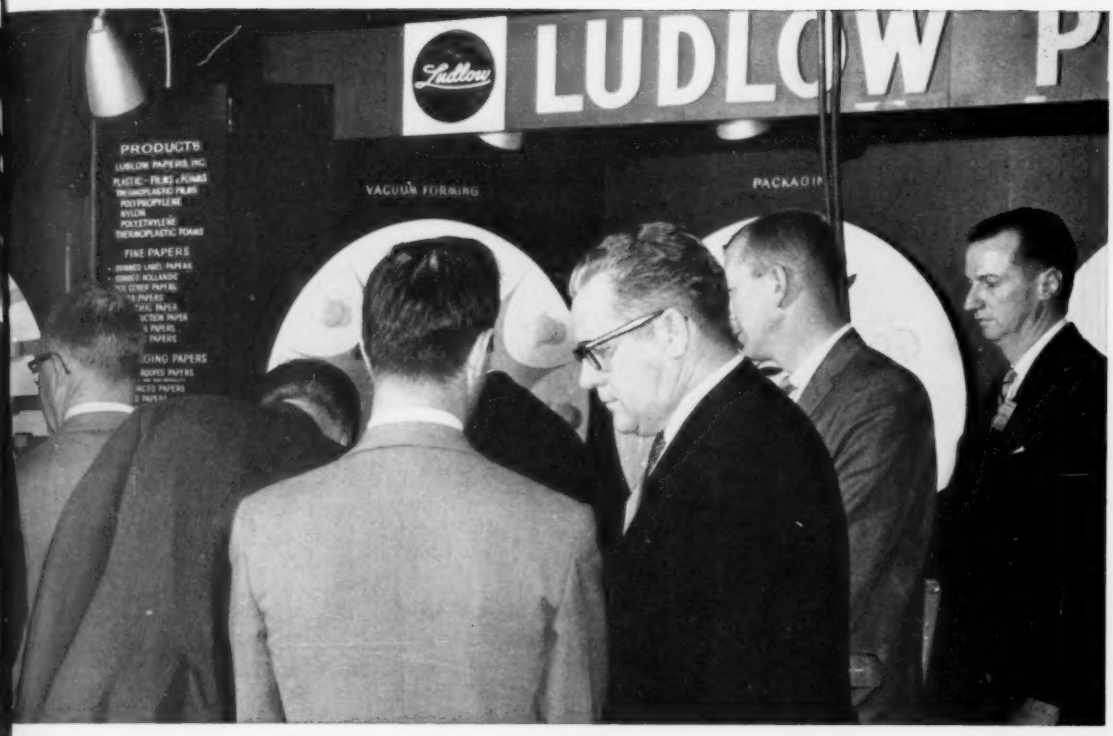
CAPLENE — made from nylon-6

These films are also available in combination with paper, foil, cloth or other films.

Couldn't see it at the Show?



METAPLENE was successfully demonstrated as a hosiery package overwrap (size 7″ x 8″ x ½″) on a Hayssen 82-L packaging machine.



METAPLENE* Sparkles in Machine Demonstration

One of the star performers in the AMA Packaging Exposition this year was METAPLENE, Ludlow's versatile new medium-density polyethylene film. Demonstrated on a Hayssen wrapping machine, METAPLENE displayed a balance of stiffness and flexibility that results in tighter fitting, better looking, longer lasting overwraps. It performs equally well on bag and pouch making equipment and the products it can package range from textiles to toys.

METAPLENE has unusual sparkle and clarity . . . the magic ingredients that add extra sales appeal to your product. But there's *more* to METAPLENE than meets the eye. Its tensile strength, for instance, is much greater than that of ordinary polyethylene. METAPLENE protects your product from vapors, gases, greases, oils and odors. It's easily heat-sealed, too, through temperatures from 250 to 325°F.

Shelf life? It's greater than cellophane's . . . Cost? It's *lower* than cellophane's. And METAPLENE gives you the cleanest, sharpest printing you ever saw. Want *more* facts? Send today for samples and technical data on METAPLENE and other new plastics made from Ludlow's exclusive new cast film process.

* Trademark Ludlow Papers, Inc.

LUDLOW PLASTICS

NEEDHAM HEIGHTS 94, MASSACHUSETTS

Ludlow Plastics is a division of LUDLOW PAPERS, INC., manufacturers of fine papers, gummed label papers, gummed tapes, building papers and packaging papers. Ludlow Papers, Inc., is a subsidiary of Ludlow Manufacturing & Sales Company, manufacturers of jute and jute products.

For more information circle No. 253 on Reader Service Card, Page 66

Structural design notes for corrugated containers

Note No. 6:

Stiffness of corrugated board in relation to box rigidity

By K. Q. Kellicutt,
Engineer,
Forest Products Laboratory,
Forest Service,
U. S. Department of Agriculture,
Madison, Wisconsin

Introduction. In Notes Nos. 1 through 5 of this series,* it was shown that appreciable differences exist between, and within, the various grades of paperboards; and that, when these boards are combined, as in corrugated board, other manufacturing variables are introduced, while still more are added when the box is fabricated.

A meaningful test of the board will tell whether all of the inherent strength of the components is being developed in the structural material. Such a test can also show the function of each component sheet and its contribution to the overall strength of the box.

Static Bending Test

One very important property of corrugated board is stiffness. A bending test used to evaluate stiffness is the subject of this note.

The static bending test is simple to make. The specimen is placed horizontally on two supports, one at each end, and a vertical load is applied, commonly at the center or midspan. As the load is increased, simultaneous readings of load and specimen bending are taken. **The lower the deflection for a given load, the greater the stiffness of the material tested.**

The details of such a procedure are included in American Society for Testing Materials Standard D-1098-52. Fig. 1 shows the general setup for the test. A simplified method of making the test, when suitable testing machines are not available, consists of applying the load by means of water running at a definite rate into a pail suspended from a stirrup at the midpoint of the beam (*3*).

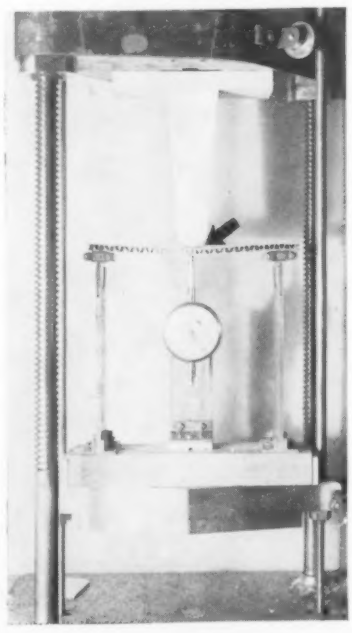


Fig. 1. A bending test specimen is shown supported at both ends with the load being applied at the center (arrow). A dial gauge for measuring deflection is shown directly under the loading point.

Generally, for a complete analysis of the stiffness properties of corrugated board, bending tests would be made on some specimens with the corrugations parallel to the length of the span and on others with the corrugations perpendicular to the span. In his early work with the bending test (*1*, *2*), T. A. "Tac" Carlson showed that **the stiffness value for a specific board was dependent on how the corrugations were oriented to the span, on the shear rigidity of the corrugations, and on the length of the span. He found that, when the corrugations are parallel to the length of the specimen, the amount of deflection due to shear is small, and for spans greater than 10 or 12 in. can be neglected.**

Carlson also found that, **when the corrugations are perpendicular to the length, the amount of shear deformation assumes greater proportions, and in spans of 5 in. or under, it is equal to, or greater than, the deflection due to tension and compression of the liners.**

This note is confined primarily to spans of about 10 in. and specimens with corrugations parallel to their length. The bending reaction of such specimens closely simulates the bending that takes place in the vertical panels of a conventional box when a crushing load is applied in the top-to-bottom direction.

Board Stiffness

Other factors that influence the stiffness of corrugated board include the kind, thickness, and weight of the liners and corrugating medium; size and number of corrugations; the adhesive bond; and the quality of fabrication. The influence of the various factors on stiffness can best be demonstrated

* (Editor's note: Notes Nos. 1 through 5 appear in the February to June, 1959, issues of *Package Engineering*, respectively.)

by use of a conventional beam formula in the following form:

$$EI = \frac{PL^3}{48\Delta}$$

in which E is the modulus of elasticity, I the moment of inertia of the cross section, P is the applied load, L is the span (distance between supports), and Δ is the deflection of the beam at the center. The quantity EI is a stiffness factor that is often used to express relative stiffness or rigidity.†

It may be seen from the formula that, as either, or both, the modulus of elasticity (E) and moment of inertia (I) are increased, a greater load (L) is required to attain a specific amount of deflection (Δ) of the beam, provided the span (L) remains constant. In reality, when greater stiffness is desired in a corrugated board, adjustments are made by changing to liners with a higher E; or, if the desired stiffness cannot be attained in that manner, a larger flute is used. Sometimes both changes are necessary in order to increase the stiffness the desired amount.

It bears emphasizing that the liners are primarily the load-carrying members of a corrugated structure, and the corrugating medium functions primarily to space the liners. For example, consider boards "V," "W," and "X" of Table I, all of which have the same liners. It may be seen that the stiffness factor EI for these three boards is essentially the same. Yet, in tension tests of the corrugating mediums, the modulus of elasticity (E) for the across-machine direction was found to be 318,600 lb./sq. in. for the kraft board, 111,550 for the steamed pine groundwood, and 141,480 for the straw board. The fourth board to be made in this series, "Y," also had the same liners as those used for "V," "W," and "X," but its corrugating medium was chestnut chip.

The EI for board "Y," 129.67, is about 8 per cent higher than the EI for boards "V," "W," and "X," but the E of the chestnut chip corrugating medium (184,150 lb./sq. in.) was over 60 per cent higher than the lowest E for the group, that for steamed pine groundwood.

Further, in view of the similarity of the EI values for boards "V," "W," and "X," which employ corrugating mediums with E values differing by as much as 3:1, the higher EI of board "Y" is also within the limits of variation that can be expected for corrugated board. **When a change is made in the liners, however, the stiffness is changed more directly.**

For example, consider boards "X" and "I" in Table I, both of which are A-flute boards having similar corrugating mediums but different liners. The EI for board "X" is 120.05 and the E of the liners is about 321,000 lb./sq. in. For board "I" the EI is about 61 per cent of the EI for board "X," and the E of the liners for that board was found to be about 135,000 lb./sq. in., or about 42 per cent as high as that of board "X." These examples show the effect of changing the E of the components.

The effect of changing the dimensions of the board and the effect on stiffness resulting from changing the moment of inertia, I, can be illustrated by a comparison between an A-flute board, "V," that has the same components as the B-flute board, "OO," of Table I. The EI for board "V" is 119.00, while the EI for board "OO," which essentially differs only in that it is thinner, is 44.10. A C-flute board made from these same components in a thickness between that of the A-flute and the B-flute boards would have an EI about midway between the 119.00 and 44.10, or about 82.

TABLE I

Bending Stiffness For Several Corrugated Boards Made From Various Combinations Of Component Paperboards With Either A- Or B-flute Corrugations

Board No.	Kind Of Flute	Kind And Weight Of Paperboards				Stiffness Factor (EI)
		Liners		Corrugating medium		
			lb./1,000 sq. ft.		lb./1,000 sq. ft.	per in. width
V	A	Fourdrinier kraft	52.1	Fourdrinier kraft	26.1	119.00
W	A	Do	52.1	Steamed pine groundwood	29.8	120.01
X	A	Do	52.1	Straw	34.1	120.05
Y	A	Do	52.1	Chestnut chip	30.0	129.67
I	A	Jute	64.7	Straw	34.3	73.60
SS	B	Do	64.6	Straw	33.6	28.93
OO	B	Fourdrinier kraft	52.1	Fourdrinier kraft	26.0	44.10

Literature Cited

(1) "A study of corrugated fibreboard and its component parts as engineering materials," *Fibre Containers*, July, 1939.

(2) "Bending tests of corrugated board and their significance," *Fibre Containers*, March, 1940.

(3) McCready, D. W., and Katz, D. L., "A study of corrugated fibreboard, the effect of adhesives on the strength of corrugated board." (Ann Arbor: University of Michigan, Department of Engineering, Feb., 1939) Research Bulletin No. 28.

†The stiffness factor (EI) may be determined from any load and the corresponding deflection at or below the proportional limit of the material.

Four steps to effective packaging research

(*Continued from Page 57*)

Sometimes the director of research and development personally must make an effective presentation on behalf of ideas he wishes to advance. It may take virtually a sales presentation to get acceptance of an idea by others at such a meeting. All this assumes adequate preparation by the director and of his being ready when making his presentation.

Spirit Of Teamwork

Lest these references suggest a seeking of personal credit by anyone, **it is important to establish the practice of not letting difficulties develop over credit for work** or as to whose name should go on the patents.

Whether a patent or a research project, it often happens that so many people work on a project it is impossible to assign purely personal credit. At the same time, there is no doubt concerning the fixing of organizational responsibility for work. Where there is a group responsibility, that responsibility must be met, but the approach in doing so is one of teamwork.

A Funnel Spout

A useful analogy is to think of it as **a variety of services blown into a funnel of which just one man happens to be the spout.** Even he recognizes it is clearly a teamwork approach. As a result, our people are not concerned as to whose name goes on a report or a patent. They realize any effort on our part is a "team" effort and the results and the credit insofar as internal management is concerned are judged on the team effort and credited to the team. Building this sort of relationship or teamwork is conducive to effective management of research and development. Thus we are able to make our basic principles work.

(*End*)

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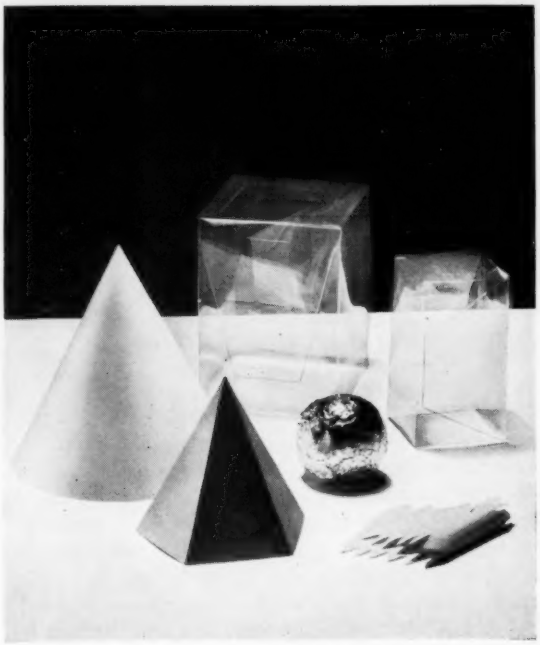

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Let's not take manual packaging for granted

Packaging line techniques requiring the use of people's hands can be efficient or inefficient, simple or complex, economical or costly and flexible or limited. Because no area of packaging is so paradoxical, it is time we take a closer look at the pro's and con's of manual packaging and crystallize our thinking about making best use of it. Properly used it is a distinct asset; improperly used, a burdensome liability.

Perhaps what we really need is a new attitude toward manual packaging. Far too many production line experts are mechanization-oriented and think of manual packaging as a necessary evil to have in situations where a machine won't work. Unquestionably the resourcefulness of packaging machinery designers and users alike will lead to many advancements in automatic packaging. There still are far too many "no-man's land" areas where manual packaging is merely filling a void pending development of just the right automatic or semi-automatic equipment.

In any case we urge switching from defensive to offensive thinking about manual packaging. The economics of short-run, diverse product, frequent changeover packaging dictate paying more attention to the potential efficiencies that systematic refinement of manual packaging has to offer.

Try positive approach to manual packaging

An obvious approach is to develop it on something like a scientific basis. In some plants the industrial engineers have worked out manual packaging methods with a stop-watch basis, in accord with the normal practices of their work. Others have systematized these techniques in terms of predetermined time values for various combinations of standard motions instead of doing it with a stopwatch. Regardless of the system used, our point is that the engineers have worked towards eliminating wasted motions and inefficient arrangements and practices.

However, a lot of this takes place half-heartedly because of management's fundamental belief that manual packaging should last only until someone can install machinery and equipment to do the same job. There is a lot to be said for this viewpoint—especially as wage and fringe benefit costs continue to rise. The trouble is that the growing support for this viewpoint obscures what we think is a more fundamental issue—that of taking a new look at manual packaging.

It is time to consider it as a valuable tool, one capable of increasing effectiveness. What makes this more and more important is the trend in so many fields to shorter runs, more product diversification, greater variances in container styles and sizes, and so on. The short-run specialty item is gaining in prominence and volume. Plants that run day in and day out on the same product and in same package make spectacular examples of packaging progress but are not as numerous as one might imagine.

We urge more packagers to ask themselves not "what is the least amount of manual packaging we must have," but rather, "How can we make the most of the inherent flexibility in using five fingers on two hands." Even seasoned production experts sometimes fail to appreciate the value of an inspection job that can take place while someone is picking up, turning over and setting down a package.

Strive for best use of people with equipment

Today's marvels of packaging line mechanization turn our thinking away from the basic values of manual packaging. Instead of waiting for someone to invent a machine that will do some job, we should strive consciously to make the most effective use of the skills of people—to do it now.

Further, it is not a question of machines versus people, but rather machines and people. Some of the most efficient operations in packaging entail carefully coordinated manual techniques geared to assembling and feeding packaging and product to automatic machinery.

Finally, the difference between taking an offensive versus a defensive attitude toward manual packaging is this: Resourcefulness in devising new methods, new techniques for doing packaging jobs. Whether by time and motion or any other method, these techniques need to be systematized into orderly channels of development rather than neglected and allowed to exist haphazardly throughout the packaging operation.

Bruce Hollingren

Editor

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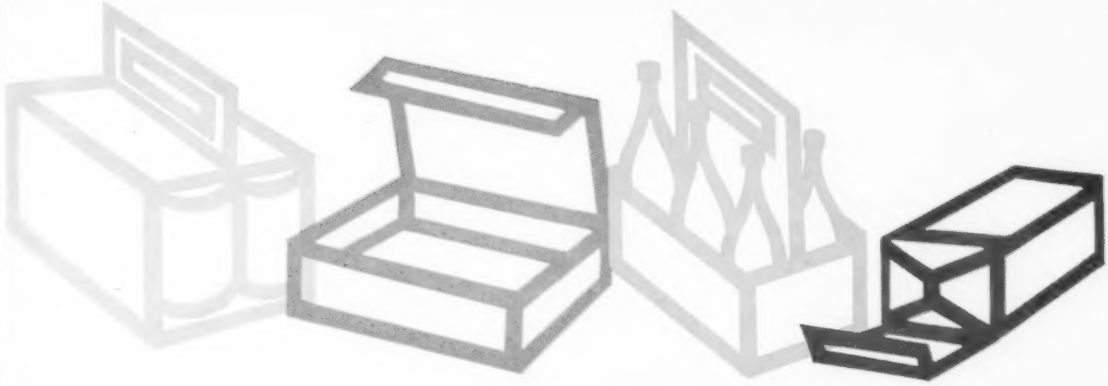

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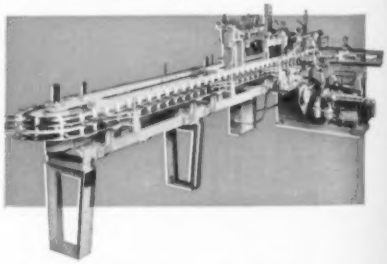

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